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Snow Stimulates Traffic by Putting Autos in Storage

LAST winter was a record breaker for snow in New England and Central New York and most of the electric railway properties in that district show a greatly increased expense for snow removal. But for every drawback there is nearly always some compensating advantage, and in this case it lies in the fact that the snow interfered with the operation of private automobiles to a greater extent even than with the trolley cars. The result was that whenever an automobile was put up for the winter, the former users of it had to use the trolley system of transportation, and this meant an increase in revenue.

To quote the figures for one property, on the Eastern Massachusetts Street Railway the railway revenue for January and February, 1923, was 7½ per cent higher than during the corresponding months in 1922. How much of this increase was due to the temporary discontinuance of private automobiles because of the unusually severe winter and how much to other causes it is, of course, difficult to say, but the condition suggests a query as to whether, at least for some of the roads in the snow belt, the peak of the business in the future may come in the winter when the autos are largely in storage rather than in summer when they are active.

If such a condition is brought about it will mean a number of changes in operating conditions. One of these is that if there is also less of a lighting or power load on the central power station in summer than in winter the two cannot supplement each other as the peak of both will come in the winter. This, for some power installations, may mean extra equipment. Effects of equal import may occur in other departments.

"Human Talent Is the Most Precious Thing in the World"

RICHARD T. ELY has written an article for the February issue of *Administration* on "Competition in the New Era." Like all other economic subjects about which Mr. Ely has written, he has touched this one with a shaft of lightness that is most alluring. He says that the business man should seek to confer favors rather than secure them. Further, he says that the business man should turn away from the allurements of special privilege, for they are more likely to land him in the ditch than to bring him fortune. Railway men particularly will agree with him in this, having formerly operated under monopoly conditions.

On the other hand, in an open field with keen competition there are the outstanding records of such men as Wanamaker, Marshall Field, Woolworth and others. However much one may disagree with the ideas of Mr. Ford, there is no question but that in his case and in the case of others competition has brought close together merit and reward.

But the question will be asked, what has all this to do with the railway operator? A great deal. There are many cases of unfair competition between bus and railway, but there have also been some cases of unwarranted complaining. Now complaining won't get anybody very far. In the face of competitive conditions, Ford, Field, Woolworth and others didn't holler. It would have done them no good. Neither did Garrett Seely out in Youngstown, when he found that the need existed for motor bus service connecting the towns served by the railway of which he is the head. He may or may not have been conscious of the new era of competition about which Mr. Ely writes, but he did recognize a public demand and set about to satisfy it. What was the result? Just this. He has all the business on the electric railway that he had before and, in addition, as told in ELECTRIC RAILWAY JOURNAL for Jan. 27, 1923, page 169, he has created an entirely new business by supplying a public demand. Other railway managers would do well to take a leaf out of Mr. Seely's book. His case proves, as Mr. Ely has pointed out, that after all "human talent is the most precious thing in the world."

Why College Men Do Not Stay in the Transportation Department

COMMENT has been made on this page concerning the opportunity for college men in the transportation department of electric railways and the difficulty of interesting them in that phase of the business. Another and perhaps greater difficulty is to keep them satisfied once they are in that department. There are reasons for this which will bear consideration.

Under the usual conditions, a transportation man is expected to be on call twenty-four hours a day and 365 days a year. He has no time for family or play. His whereabouts at all times must be known at the office, and any personal engagement he may make is subject to the proviso "if business permits." He can call no part of his time really his own. Such a life does not appeal to the college graduate. His education has given him a wide mental horizon and a variety of interests. He appreciates the value of music, art and literature, as well as science and economics. He knows that some mental relaxation and physical exercise are essential to good work.

When the young engineer enters the transportation department he is required to give up all outside interests. If he revolts against such conditions, the old timers in the railway business mistakenly think he is lazy and contemptuously recall how hard they used to work when they were his age. It is not because he is less willing than they to work hard that the college

graduate objects to this routine, but because he has a different point of view. He knows that "perpetual devotion to what a man calls his business is only to be sustained by perpetual neglect of many other things," and he is disinclined to give up everything else. All this reference to unremitting responsibility applies as well to other men now occupying positions in the transportation department. It is as unfair to them as to the young man entering the work, but they are less free to break away from the job.

A rearrangement of duties is needed so that continuous responsibility shall not have to be borne by any one man. For example, on a large railway an operating division might perhaps be handled by two assistant superintendents, one being responsible during the day and the other during the night, with the change in shifts occurring so as to have a heavy day responsibility and a light night force, or so as to have one of the rush periods in each shift. Both assistants would report to the superintendent, but either would handle any situation, except a very great emergency, without calling on the other. In other words, each assistant superintendent and his staff would be subject to call twelve hours a day and only twelve.

On a smaller property the superintendent might take one shift himself, with his one assistant superintendent handling the other. Such an arrangement would give the supervisory transportation men some time they could really call their own. If that were done the railways would not only get better men in the transportation departments, but also better work from everybody, for there would be time to think beyond the immediate job of keeping the cars moving.

Combustion Engineering Is Making Rapid Advances These Days

THE sudden increase in the price of coal during the last few years is one of the compelling reasons for the present renaissance of boiler-plant development. Possibly another reason for this was the realization on the part of power engineers that the turbine room was outdistancing the boiler room in the race for efficiency.

Most remarkable is the way in which some responsible designing engineers have seized upon pulverized fuel burning as a remedy for some of their difficulties. It is true that as yet there are few utility power plants operating with powdered coal, but many of the plants now in contemplation or under construction will be so equipped. The reputed success of the Lakeside plant of the Milwaukee Electric Railway & Light Company, a description of which was covered in the issue of this paper for April 15, 1922, page 633, has brought countrywide attention to the subject.

One of the utilities which has been convinced is the United Electric Railways of Providence, R. I. This company has ripped out approximately 30 per cent of its present boiler capacity and is now putting in new, larger, higher pressure boilers with pulverized coal furnaces.

One factor which has been influential in this development is, of course, the possibility of using coal of poor grades in pulverized form. However, it appears that good coal can be advantageously burned in this form also. In Providence provision is being made, through arrangement of design and selection of types of equipment, to obtain a completed plant which will lend itself to investigation, on a broad scale, of different kinds of coals under regular operating conditions.

All of this does not signify that the day of the stoker is past. Far from it. Improvements in the stoker are constantly being made, and competition with this new rival will stimulate further improvements. In the meantime oil burning is on the increase, also. Boiler design is making rapid strides. Devices for the more intelligent operation of the boiler plant are constantly being developed. All of this points to the fact that combustion engineering is a vigorous art, and science as well. If the boiler room efficiencies which are now promised materialize in regular practice, the boiler will soon rank with the turbine, the electric generator and the electric transformer as an energy transforming device, if in fact it does not do so already.

Relations with Employees Should Be Based on a Spirit of Mutual Helpfulness

IT IS common to attribute to the present large size of many industrial organizations much of the lack of understanding which is often observed between employer and employee. In the day of the small undertaking, it is said, the proprietor knew every employee by name, and each of them had a greater interest and pride in the product than now, when he is engaged in a small repetitive part only in either production or merchandising. This argument against lack of co-operation loses its force, however, when one studies the work of some of the largest companies in the country which have made an effort to foster the right kind of relationship between men and management.

One of these companies is the American Bell telephone system, which, under the leadership of the late Theodore N. Vail, did pioneer work in the department of public relations. For many years its practice in this respect was far in advance of most of the other utilities of that time. Now it is doing equally important work in the department of management. In a recent statement, Vice-President Hall attributed much of the trouble with the laboring man at present to the theory that industry has become so big he has no recognized place in it except as one in a division or group, and that condition hurts his pride. Continuing, Mr. Hall said, in effect, that his company believes in making every man feel that he is an important member of the family, and that it should help each employee to get interested in his job, know what the policies of the company are, why they are adopted, and appreciate the part that he plays in the whole organization. To say that the president's door is always open for an employee is not sufficient. Means must be provided by which he can get there and back easily. This connection can well be supplied through some form of employees' organization, provided that organization is one based on the principle of co-operation and mutual confidence rather than on antagonism and mutual distrust.

The telephone company, of course, is not the only one to have progressed in this direction. The United States Steel Company has done considerable along this line, and there are of course certain railways which have accomplished much. An able plea for further progress by electric railway companies was made at the last meeting of the New England Street Railway Club by George E. Pellissier. Altogether the subject is one which could properly be considered as ranking, in importance, with public relations.

This Train Yard Has a Concrete Floor, so That the Passengers Can Board the Cars Easily at Any Point in the Yard

New Terminal in Baltimore

The Washington, Baltimore & Annapolis Electric Railroad Installs a Model Interurban Terminal for Freight and Passenger Service

ABOUT a year ago the Washington, Baltimore & Annapolis Electric Railroad completed its terminal station in Baltimore at the corner of Howard and Lombard Streets. The station is in the heart of the downtown district of the city.

The new station for both passenger and freight was planned several years ago, and the real estate has been owned for some time, but, owing to conditions brought about by the war, construction was delayed until the summer of 1921. Ground was broken on April 1, and the building was occupied for the first time on Nov. 1 of that year. The trackwork was started about June 1, 1921. Altogether, the yards and buildings occupy a total area of 78,094.40 sq.ft. divided as follows:

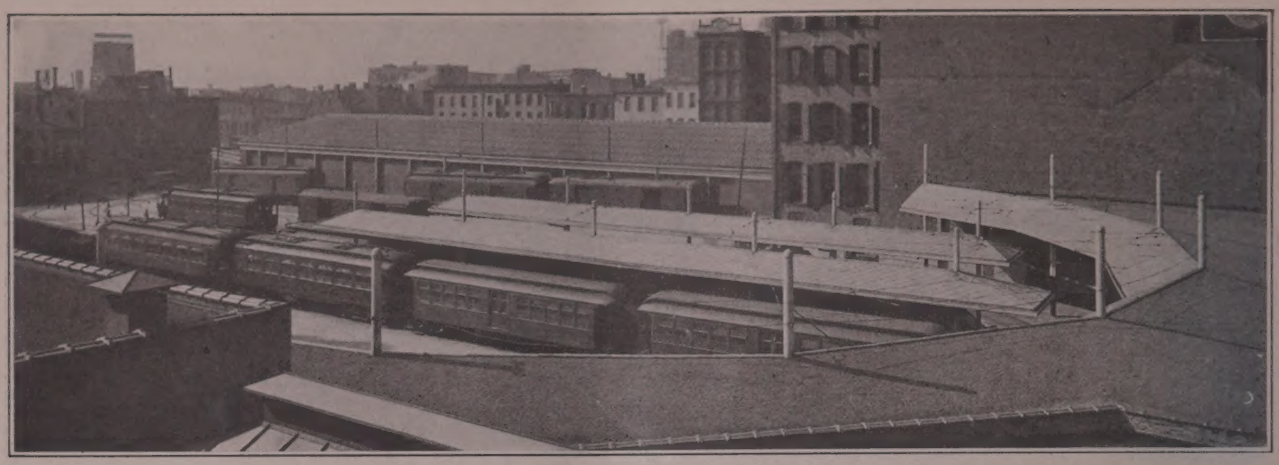
	Square Feet
Freight house	9,006.23
Driveway	4,320.00
Parking	853.00
Freight office	1,394.47
Freight yard, track incline	2,700.00
Terminal yard	51,389.15
Baggage room	1,196.45
Terminal station	7,234.30
Total	78,094.40

TERMINAL YARD

A feature of the terminal yard is that it is concreted throughout, as shown in the general view above, making a very clean job and one that can be flushed easily. The concrete flooring also enables passengers to board the cars easily at any point in the yard.

The passenger terminal tracks consist of four stub tracks and one loop. The trains to Washington or those on the main line of the company are dispatched from the stub tracks, while the trains to Annapolis are sent from the loop. The four stub tracks are fitted with pits for temporary repairs to cars. Altogether, the passenger tracks in the yard have a capacity for forty-eight cars. This is independent of the freight car track, which is on a slight incline, to conform with the grade on Eutaw Street.

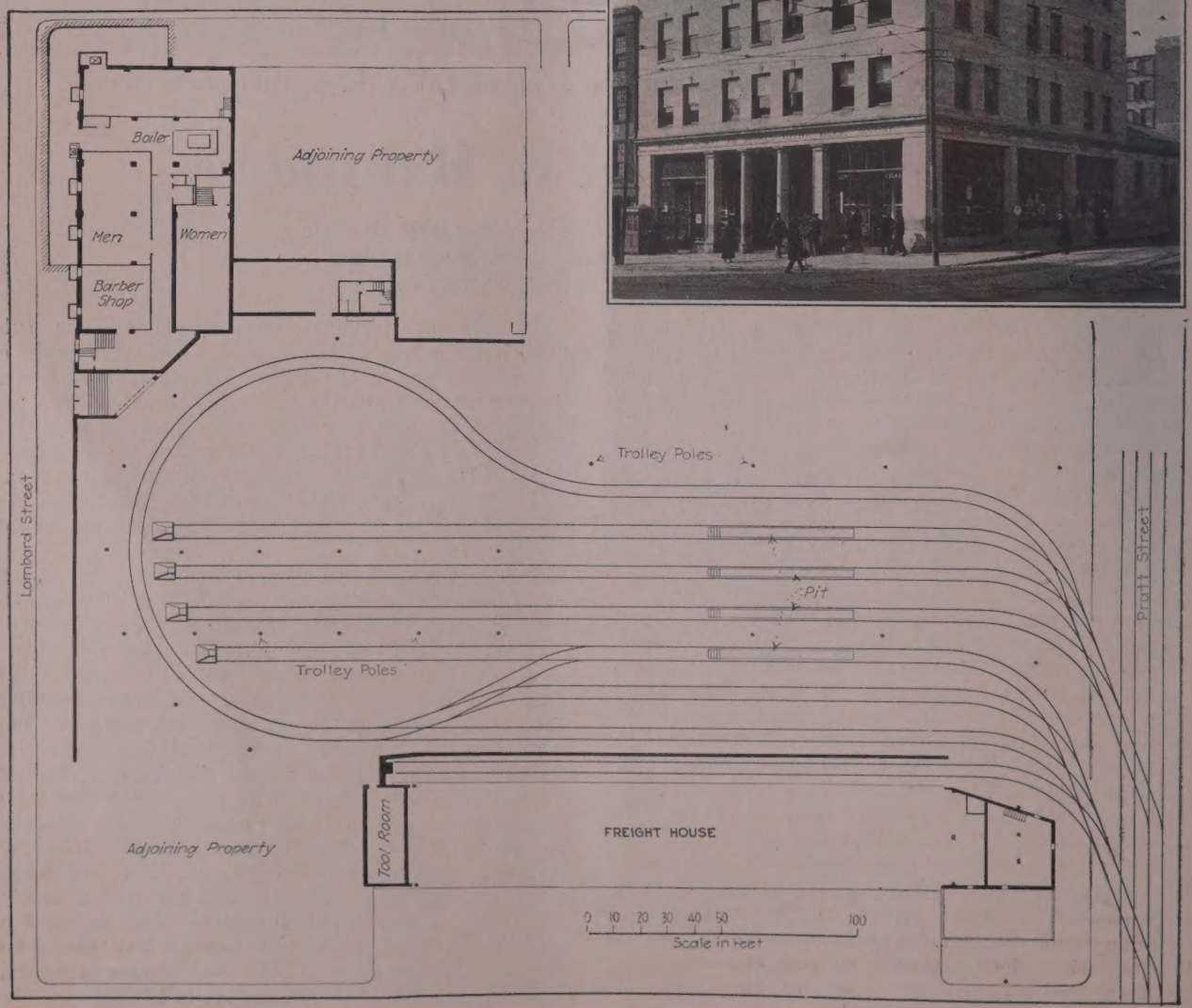
During normal times, the company handles about 8,000 passengers per day from the terminal. This means from fifty to sixty cars per hour during the rush period. The normal week day service to Washington is about every half hour from 6 a.m. to 12 o'clock midnight, with additional local trains starting at 5 a.m. and running about every two hours, except between 5 and 8.30 p.m., when they are run more frequently. The Annapolis trains operate over the South Shore division on an hourly schedule from 6.35 a.m. to 3.35 p.m. Then they run more frequently until 7.35 p.m., when they go to a longer schedule. On the North Shore division, half-hourly service is maintained from 5.50 a.m. to 7 p.m., then hourly service until midnight, making approximately 100 trains leaving the Baltimore terminal daily. On Sundays and holidays the train service is increased to some considerable extent. The company does no local city business, and its minimum fare is 10 cents.



Above—This View of the Train Yard Is Taken from a Fourth Floor Window of the Office Building.

At Right—The Terminal of the W., B. & A. Electric Railroad in Baltimore Is in the Downtown Business Section.

Below—Plan of the Terminal Yard and Basement of the Office Building.



The overhead construction in the yard is Ohio Brass equipment with steel poles and was all installed by the railroad company. The tracks in the yard are for the most part T-rail, 7 in. high and 98 lb. per yard, with some Lorain steel 141-465 9-in. girder.

Main Terminal and Freight House

The terminal building, the main building in the group, is of reinforced concrete with Indiana limestone finish, with terrazzo or ground marble and cement floors in the waiting room and basement, and Toncan metal roofing. It has four floors besides a basement.

The basement, which is shown in plan in the drawing of the track yard, contains five banks of six toilets each, four banks being pay toilets and two free. There is also a barber shop in the basement.

The ground floor contains the waiting room, lunch room, novelty store, telephone and telegraph booths, ticket office, baggage and parcel checking room and the entrance to the train sheds. The two stores opening into the waiting room are leased. The telegraph service is somewhat unique in so far as it allows a patron to get in direct communication by telephone with the central telegraph office and give his message over the wire. He pays for it in a coin box.

The second floor contains the president's office, general manager's office, conference room, purchasing agent's office and office of the passenger agent and assistant to the president. On the third floor are the freight department for checking way bills, the general freight office, claim agent's office and also the treasurer's office. The fourth floor contains the general auditing office. Each floor has its own vault for files, records and supplies.

The team way for the freight house is on Eutaw Street and the floor follows the grade of this street, which has an incline of 2½ per cent. The freight track in the terminal yard also follows this grade. About twenty cars a day each way represent the average freight and express business done at present. The Southeastern Express Company operates over this line and handles all express business.

The architects for the terminal building, train shed and freight house were Dreher, Churchman, Paul & Ford, Philadelphia. The building contractors were the George A. Fuller Company, New York. The special trackwork was supplied by the Lorain Steel Company and was installed under the direction of E. W. Weinland, engineer maintenance-of-way of the company. J. J. Doyle is vice-president and general manager.

The Waiting Room Is Open and Attractive

City Pays Half of Deficit

THE British Columbia Electric Railway started its first bus route on March 19. It is in the city of Vancouver over a route about 2 miles in length, from the terminal of one of the car lines. One bus gives the service and there is a spare one.

One of the features of the new service is the arrangement with the city of Vancouver whereby the city pays one-half of any deficit. The company pays the other half only up to a maximum of $5,000 a year. This agreement was made last November, when the company obtained a continuance of its 6-cent fares and gave a reduction in its lighting rates. If successful, it will be the basis of other bus routes. The first week's traffic filled the bus to capacity in the rush hours. The city is owner of considerable property along the route.

Duluth Street Railway Valued

Valuation Estimates Presented by Consulting Engineers Before State Commission—Cost of Power and Bridge Contracts Included as Items of Value

ON FEB. 6 Mr. Drum of A. L. Drum & Company, Chicago, completed his testimony in the rate case of the Superior division of the Duluth Street Railway before the Railroad Commission of Wisconsin at Madison, Wis. An inventory of the property was made as of Oct. 1, 1922, and valuations of the property were prepared and submitted on four bases, namely, pre-war costs, ten-year average cost, post-war cost as of June, 1921, and estimated original cost at prices current as of date of installation. A table showing the summary of the physical property on these four bases is printed herewith, showing the percentage relationship of the latter three bases to the pre-war cost.

It is interesting to note that the valuation based on estimated original cost compares very closely with pre-war cost, being only 3.72 per cent higher than the pre-war cost, while the ten-year average cost shows an increase of 36.20 per cent, and June, 1921, prices show an increase of 76.96 per cent over pre-war costs.

In addition to the valuation of the physical property Mr. Drum submitted valuations showing the developmental cost of the property, value of a bridge contract, which permits of operation over the bridge connecting Superior, Wis., with Duluth, Minn., without additional bridge toll to the passengers of the street railway system, and value of the power contract. The value of the power contract was based on the cost to the company in obtaining this contract and perfecting a satisfactory source of power supply from the hydro-electric plant of the Great Northern Power Company. The power company paid the cost of maintaining the company's steam plant in operating condition from 1908 to 1914, while the power company was demonstrating its ability to furnish all power required, but the railway company was required to pay the insurance, taxes and interest on the plant from 1908 to 1915, when the steam plant was finally abandoned, and also suffer the loss of the investment in the plant equipment (less salvage), and these items were properly submitted as the actual cost to the street railway company in obtaining the power contract. These costs summarize as follows:

Cost of power station, land, building and equipment less salvage	$47,702.79
Interest on amount of salvage Jan. 1, 1908, to Dec. 31, 1915, at 6 per cent	5,015.76
Taxes paid on power station Jan. 1, 1908, to Dec. 31, 1915	5,551.34
Insurance paid on power station Jan. 1, 1908, to Dec. 31, 1915	2,783.59
Total cost of power contract	$61,053.48

To show that this cost in securing and perfecting the power supply was a proper expenditure on the part of the company estimates were made of the resulting saving in cost of power, as given in the table below.

	Investment on Basis of Present-Day Prices	Investment on Basis of Pre-War Prices
Total investment required for 1,500-kw. steam station and 1,500-kw. substation	$273,500	$183,600
Cost of manufacture of power, present-day prices:		
Coal	21,350	21,350
Labor	12,900	12,900
Maintenance, supplies and general	7,500	7,500
Total operating expense	41,750	41,750
Fixed charges, interest, depreciation, taxes and insurance	34,200	22,950
Total cost of power	$75,950	$64,700
Cost of power per kw.-hr., 4,000,000 kw.-hr., a.c.	$0.0190	$0.0162
Cost of power per kw.-hr., 3,720,000 kw.-hr., d.c.	0.0204	0.0174
Cost of power purchased under contract	0.0100	0.0100
Saving per kw.-hr.	$0.0104	$0.0074
Saving per year (3,720,000 kw.-hr.)	$38,688	$27,528
Present value of future saving from Oct. 1, 1922, to Nov. 17, 1931, each annual saving being discounted at 8 per cent from the end of its year to Oct. 1, 1922	$244,972	$174,307

COMPARATIVE SUMMARY OF COST OF REPRODUCING AND DEVELOPING THE PROPERTY OF THE SUPERIOR DIVISION, DULUTH STREET RAILWAY, AS OF OCT. 1, 1922, SHOWING PER CENT RELATIONSHIP OF BASES 2, 3 AND 4 TO THE PRE-WAR COST, BASIS NO. 1.

	Basis No. 1 Pre-War Cost Current Prices 1915	Basis No. 2 Ten-Year Average Cost Average Prices 1912–1921		Basis No. 3 Post-War Cost Prices Current June, 1921		Basis No. 4 Estimated Original Cost Prices Current Date of Installation	
Physical property	Amount	Amount	Per Cent of 1915	Amount	Per Cent of 1915	Amount	Per Cent of 1915
Land	$23,200	$23,200	100.00	$23,200	100.00	$23,200	100.00
Track	560,483	783,423	139.79	1,057,475	188.69	612,425	109.27
Paving	69,472	76,470	110.07	84,468	121.58	71,398	102.77
Electrical distribution system	68,137	89,441	131.27	105,578	154.95	68,137	100.00
Rolling stock	235,125	361,364	153.69	485,207	206.36	235,842	100.31
Shop machinery and tools and miscellaneous equipment	35,339	46,216	130.78	56,235	159.13	35,339	100.00
Buildings	61,329	81,823	133.41	101,627	165.71	49,853	81.29
Furniture and fixtures	7,346	11,602	157.92	16,530	225.00	6,245	85.02
Materials and supplies	38,113	38,113	100.00	38,113	100.00	38,113	100.00
Total inventoried property	$1,098,544	$1,511,652	137.60	$1,968,433	179.19	$1,140,552	103.82
Expenditures not apparent in inventory	204	204	100.00	204	100.00	204	100.00
Total	$1,098,748	$1,511,856	137.60	$1,968,637	179.19	$1,140,756	103.82
Engineering and superintendence	54,937	75,593	137.60	98,432	179.19	57,038	103.82
Total	$1,153,685	$1,587,449	137.60	$2,067,069	179.19	$1,197,794	103.82
General and miscellaneous costs							
Administration, organization and legal expense	$57,684	$79,372	137.60	$103,353	179.17	$59,890	103.83
Taxes during construction	16,842	16,532	98.16	25,630	152.18	16,842	100.00
Interest during construction	73,693	101,001	137.06	131,763	178.80	76,472	103.77
Working capital	31,074	31,074	100.00	31,074	100.00	31,074	100.00
Total general and miscellaneous costs	$179,293	$227,979	127.15	$291,820	162.76	$184,278	102.78
Cost of financing	66,649	90,772	136.19	117,944	176.97	69,103	103.68
Total cost to reproduce the physical property as of Oct. 1, 1922	$1,399,627	$1,906,200	136.20	$2,476,833	176.96	$1,451,175	103.72
Power and bridge contracts							
Cost of power contract	$61,053	$61,053	.....	$61,053	.....	$61,053	.....
Value of bridge contract	78,125	78,125	.....	78,125	.....	78,125	.....
Total power and bridge contracts	$139,178	$139,178	.....	$139,178	.....	$139,178	.....
Developmental costs							
Expenditures for obsolete equipment and construction	$376,656	$376,656	.....	$376,656	.....	$376,656	.....
Cost to unify system	22,905	22,905	.....	22,905	.....	22,905	.....
Loss of interest during operation	111,970	152,496	.....	198,147	.....	116,094	.....
Total developmental costs	$511,531	$552,057	.....	$597,708	.....	$515,655	.....
Total cost of reproducing and developing the property, including value of power and bridge contracts	$2,050,336	$2,597,435	.....	$3,213,719	.....	$2,106,008	.....

The discussion at the hearing indicated that both the commission and the company were confronted with a difficult problem in determining a reasonable rate of fare on account of the company having been unable to reach an agreement with the city of Superior with respect to the regulation of the jitney traffic and the introduction of one-man cars. The general opinion was that a joint conference between the Wisconsin commission, the city and the company should be had at which reasonable requirements as to the regulation of the jitney traffic and the use of one-man cars could be agreed upon, based on which the commission could determine a new rate of fare. During the hearing the Supreme Court of Wisconsin rendered a decision in the so-called Superior jitney case, removing the control of jitneys from the jurisdiction of the cities of Wisconsin and placing the regulation of jitneys under the Wisconsin Railroad Commission.

Visualizing Schedules

By Means of a Large Board, with Grooves to Hold Sticks Representing Various Runs, a Picture Is Obtained of the Equipment in Operation and the Possibilities for Expansion or Contraction of the Service

PROBABLY the most common method used for showing at a glance the service furnished on a particular line is by a graphic layout of the timetable. In perfecting the timetable, however, frequent changes are necessary, and with the graphic method each change usually requires the replotting of the graphs. A method of visualizing the timetable that is very flexible and which shows at a glance the cars in service, the headway, the layovers, the setbacks, the time at division points, the number of crews required and the time that they are on duty, together with the possibilities of expansion and contraction of service, to meet various traffic requirements, is illustrated herewith. The idea originated with C. E. Chalmers, receiver for the Second Avenue Railroad, New York, N. Y., and was worked out by his engineering and timetable departments.

The apparatus used includes a large board and numerous trip sticks to designate the various runs. The board is 34 in. wide and 18 ft. long. Two boards are used to give the total width and by having offsets at either end the total length is increased and the space at the offset would never be used in the various layouts. The board is ruled with lines crosswise to indicate time intervals, different colored inks being used for convenience. On the Second Avenue Railroad's board time intervals are laid off horizontally, the scale being $\frac{1}{8}$ in. for each minute or $7\frac{1}{2}$ in. to the hour. Longitudinal grooves run the full length of the board. These are made to fit the trip sticks, which are $\frac{1}{16}$ in. in diameter. There is a total of eighty-six grooves in the width of the board.

The trip sticks are of wood and their length represents a round trip, the scale for time intervals of course being the same as that for the board, $\frac{1}{8}$ in. to the minute. The trip sticks are marked to indicate division points. On the Second Avenue routes there are seven intermediate time points in addition to the ends, which of course represent the same point since the trip sticks are for round trips. These time points are marked with different colored inks. The same color is used to indicate a particular time point on all trip sticks.

Since the times of layovers at the end of runs vary somewhat, these are not included in the length of the trip sticks, but in laying out the schedule spaces are left between the different trip sticks which indicate the layovers. This method eliminates a large number of different lengths of trip sticks, which of course simplifies the laying out of the timetable.

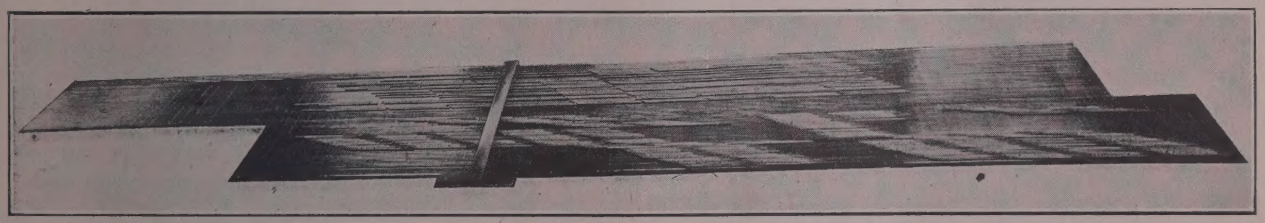
WEEK DAY — PROPERTY OF AND TO BE RETURNED TO SECOND AVE. R. R. CO., CHARLES E. CHALMERS, Receiver.

RUN 21	TRIPS 1	2	3	4	5	6
96th N	716	848	1020	155	328	504
129th	728	900	1032	207	340	516
96th S	740	912	1044	219	352	528
59th	754	926	1058	233	406	542
34th	804	936	1108	243	416	552
10th	813	945	1117	252	426	602
34th	822	954	1126	301	436	612
59th	832	1004	1136	311	446	622
96th	846	1018	1150	325	500	636

Trip Card Used for Schedules of the Second Avenue Railroad

Laying Out of the Timetable

With the board and trip sticks constructed the timetable may be laid out to visualize several different factors as desired. First, it may be laid out by crews. This shows both the regular and extra runs and shows how the swing runs must be laid out to take care of the extra service during peak hours and to provide for lunch periods for the various crews. In the accompanying illustration of the board the bottom part is laid out by this method. The regular runs are at the bottom and the swing runs just above these. By referring to this illustration, it will be seen that starting with the regular runs in the morning four round trips are made



Test Board Used for Checking Timetables of the Second Avenue Railroad

and then the regular crews are allowed time off for lunch. The first swing runs which occur are those for the morning rush hour. After this the swing runs fit in as the various crews leave for their lunch period. By this method each groove is taken up by a single crew. This of course shows the layovers, setbacks and headway at the various time points. The headway can be scaled directly by measuring the distance between the same colored line on the trip stick in adjacent grooves. This method of laying out a timetable is of particular advantage for showing the slack in the schedules and how this can be taken out by careful rearrangement. When this board was first used by the Second Avenue Railroad for checking its schedules it was able to take out 15 per cent of the slack, which of course reduced operating expenses considerably.

A second method of laying out the timetable is by cars in service. Public service commissions and the patrons of the railway are most interested in the service furnished, and this method of laying out the timetable indicates at a glance the number of cars that are in service, the headway, etc. With this method operation of the same car is laid out in the same horizontal groove. Layovers are indicated by the time between trip sticks, but of course the service is continuous as long as the car is operated regardless of what crew has it. On the board shown in the accompanying illustration the top of the board is laid out to show the cars in service on the Second Avenue line after 11 a.m. For convenience in checking the various information desired, a T-square is used which fits to the board, and by following along the edge of the square the number of cars in service, the number of crews and like information is shown at any time desired.

A third method of laying out the timetable is by intervals. When this method is used, the cars follow in their regular order regardless of whether they are on swing runs or regular runs.

After the final timetable had been adopted by the Second Avenue Railroad run cards were made out to show the time at the various division points. A sample of one of these cards is shown herewith. Runs on the Second Avenue line start at Ninety-sixth Street and go north to 129th Street; they then return south to Tenth Street, where again they turn north to Ninety-sixth Street, making the round trip. The time for the various points is entered in black and red. Black figures show time for runs in a northerly direction and red indicates time for southbound trips. When a crew takes out a car it is supplied with a run card for the particular run which it is to operate, and in checking operations inspectors check at the various time points and the crews are expected to maintain the schedule unless unavoidable delays occur. For convenience in checking the operation each car carries a run number in the right-hand front vestibule window. Inspectors are supplied with books containing all the various runs, so that they can turn immediately to the time when a car should be at a certain time point and thus check its operation.

This arrangement is also of particular use to other officials in getting in touch with crews or locating cars. Thus, if it is desired to get in touch with a particular crew, all that is necessary is to call up the dispatcher and find out the run that this crew has. Then by referring to the book it can be seen at a glance just where this crew is at a particular time. The same of course applies to cars. The location of a car at any particular time can be checked from the timetable card.

"Wired Wireless" Tried

New Duplex Current Used for Two-Way Conversation —Experiments Indicate Practicability of Using High-Frequency Current Communication

ON MARCH 26 the Third Avenue Railway, New York, in conjunction with the General Electric Company, demonstrated to a party of men the practicability of using "wired wireless" for establishing communication between any two points on the system. A laboratory set-up of a radio transmitting and radio receiving set was installed on a street car, with corresponding apparatus in the substation which supplied energy to the line over which this car was operated. Perfectly audible communication was conducted between the car and the substation from various points on the line, with the car either standing or moving.

The particular feature of this demonstration was the use of a duplex current whereby conversation could be carried on in either direction, just as it is done over the telephone. This was accomplished by utilizing two different frequencies. The transmitting set at one end and the receiving set at the opposite end were tuned for a frequency of 73,000, while the other pair of sets were tuned for 49,000 cycles. Currents of the two frequencies were thus conducted over the same wires, the trolley and feeder, without interference. By putting on the head phones of the receiving set and talking into a transmitter connected with the transmitting set, it was possible to receive and transmit without the use of any changeover switch.

The set-up in the street car consisted of an ordinary simple radio receiving set with one three-electrode vacuum tube, connected as a detector and another as an amplifier. The transmitting set made use of three type UV 203 tubes of 50 watts capacity. These three tubes were used as an audio frequency amplifier, an oscillator and a modulator. The power for the sending set was supplied by a 1,000-volt motor-generator set with the energy to operate it supplied by twelve cells of storage battery supplying approximately 24 volts. A similar set-up was used in the substation, except that in the receiving set only a single tube was used as detector and amplifier. In the substation, and in the car, the sets were connected to the trolley circuit through a condenser of low voltage drop.

The General Electric Company has been engaged in experimental work on the Third Avenue Railway for several weeks, to determine the constants of such a system, looking toward the development of suitable apparatus for utilizing high frequency carrier current for communication work. While it is possible to establish communication between any point on the system and any car suitably equipped with apparatus, the idea will be primarily to devise plans for communication between some central emergency office and line and trouble crews, construction and repair gangs, and perhaps such transportation men as starters and inspectors out on the system. The principal advantage of the wired wireless as compared to radio communication is that it requires much less input of power, and that while the current probably spreads over the entire overhead and feeder system, the radiation into the ether is very small so that it introduces practically no interference with any radio communication. The test was in charge of W. J. Quinn, electrical engineer of the railway company, and Edward Austin of the G. E. Co.

Tests of Welded Joints by the Boston Elevated Railway

Results of Compression and Bending Observations at Massachusetts Institute of Technology—Different Applications of Seam Welding

WIDESPREAD interest among electric railways and manufacturing companies is developing throughout the country in regard to the properties of welded joints. References have been made in this journal at various times during the past year to the organized investigation of this subject, which is being conducted under the auspices of the American Electric Railway Association, the American Electric Railway Engineering Association and the American Bureau of Welding in co-operation with the National Research Council and the United States Bureau of Standards. This investigation is proceeding along comprehensive lines, and in connection with it studies are being made of all available local data and information. At the request of the ELECTRIC RAILWAY JOURNAL H. M. Steward, superintendent of maintenance, Boston (Mass.) Elevated Railway, has consented to allow this paper to make public as information on this subject the results of a series of tests made by that company on arc-welded joints during the past year.

As a member of the executive committee of the joint committee on welded joints of the American Electric

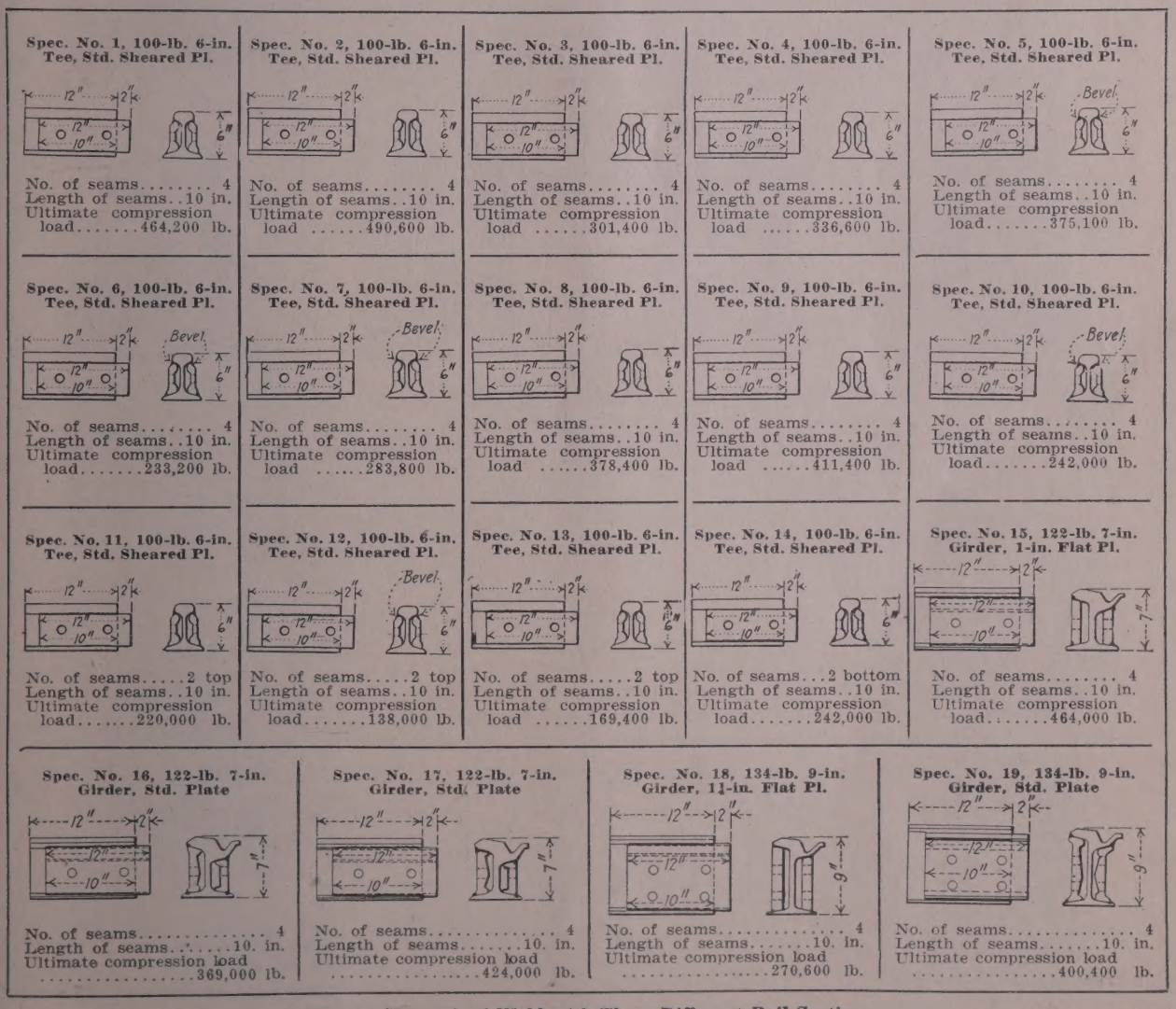


Fig. 1—Strength of Weld with Three Different Rail Sections

Railway Association and the American Bureau of Welding Mr. Steward has submitted data from these tests for critical study to other members of the committee and the comments of interested readers of this paper will be welcomed.

About 5,000 arc-welded joints are now being installed annually in new track construction by the Boston company. In order to obtain information as to the strength of such joints, arrangements were made to utilize a one million-pound testing machine of the Massachusetts Institute of Technology in the department of materials of engineering of that school at Cambridge. As the strength of the seam weld joint in tension was unknown and as no previous data on the subject were available, it was decided to use short sections of rail and joint plates rather than full-sized joints in order that the resistance to shear of the specimens would be well within the capacity of the testing machine. For this reason a seam length of 10 in. was selected. Tests were in compression, the rail section being pushed through the joint to shear.

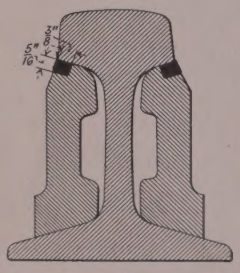
The first set of tests, Table I, were made with three different sections of rail in order to obtain data on the strength of the weld. The standard Rail Welding & Bonding Company process of welding was used on all but three specimens, which were welded by the metallic process.

This group of tests was made with and without bevels and with seams at top and base of rail, and with seams at the top only and at the base only. Fig. 1 shows the cross-sectional appearance of each joint as arranged for testing. The average ultimate load sustained by seven specimens welded with carbon arc was 357,186 lb., the area of four seams being 10 sq.in., and giving an unit stress in shear on the seam metal of 35,718 lb. per square inch.

Strengthening the Top Seam

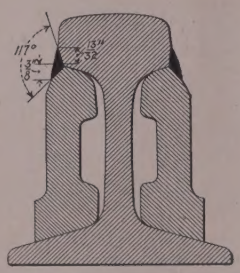
Fig. 2 shows the arrangement of specimens and data secured from the second group of tests, which was made to determine if possible a method of welding that would strengthen the top seam of the rail joint. Five different types of plate bevel were tried. It will be noted in the above group of tests that in one case the bevel was applied to the rail as well as to the joint plate. These tests were all made with 100-lb., 6-in. tee rail, A. R. A. type A, two top seams being used in each case. Since the beginning of the use of arc welding by the

100-lb. 6-in. Tee Rail—Std. Sheared Plate A.R.A. Type A Bevel "A"



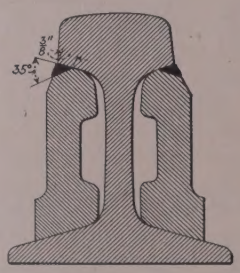
No. of seams.....2 top
Length of seams.....10 in.
Specimen..... 20
Process .....
⅝-in. rod welded in place .....⅝-in. rod puddled in
Ultimate compression load .....215,600 lb.
Specimen..... 21
Process .....
⅝-in. rod puddled in
Ultimate compression load .....240,900 lb.
Specimen..... 22
Process .....
⅝-in. rod in place .....⅝-in. rod puddled in
Ultimate compression load .....221,100 lb.
Specimen..... 23
Process..2 ⅝-in. rods in place welded in one operation
Ultimate compression load .....239,300 lb.

100-lb. 6-in. Tee Rail—Std. Sheared Plate A.R.A. Type A Bevel "B"



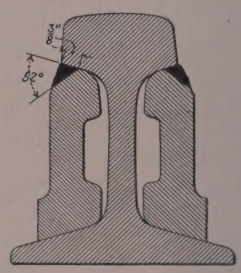
No. of seams.....2 top
Length of seams.....10 in.
Specimen..... 24
Process .....
⅝-in. rod welded in place
Ultimate compression load .....228,800 lb.
Specimen..... 25
Process .....
⅝-in. rod in place .....⅝-in. rod puddled in
Ultimate compression load .....31,900 lb.

100-lb. 6-in. Tee Rail—Std. Sheared Plate A.R.A. Type A Bevel "C"

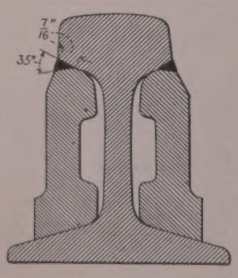


No. of seams.....2 top
Length of seams.....10 in.
Specimen..... 26
Process .....
⅝-in. rod in place .....⅝-in. rod puddled in
Ultimate compression load .....297,000 lb.
Specimen..... 27
Process .....
⅝-in. rod puddled in
Ultimate compression load .....303,600 lb.

100-lb. 6-in. Tee Rail—Std. Sheared Plate A.R.A. Type A Bevel "D"

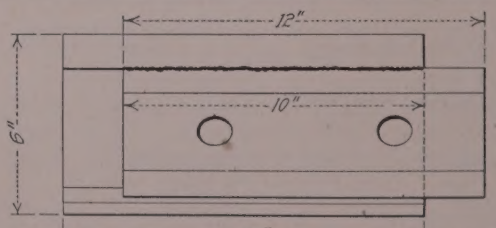


No. of seams.....2 top
Length of seams.....10 in.
Specimen..... 28
Process .....
⅝-in. rod puddled in
Ultimate compression load .....119,900 lb.
Specimen..... 29
Process .....
⅝-in. rod in place .....⅝-in. rod puddled in
Ultimate compression load .....26,400 lb.



100-lb. 6-in. Tee Rail—Std. Sheared Plate A.R.A. Type A Bevel "E"

No. of seams.....2 top
Length of seams.....10 in.
Specimen..... 30
Process....⅝-in. rod puddled in
Ultimate compression load.... .....242,000 lb.
Specimen..... 31
Process..⅝-in. rod and ⅝-in. rod in place welded in one operation
Ultimate compression load.... .....111,100 lb.



SIDE ELEVATION—Scale: ½ Full Size

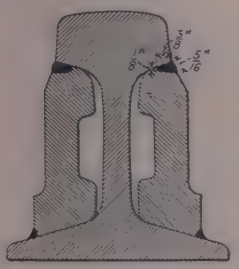
Fig. 2—Variations in Plate Bevel to Strengthen Top Seam

Boston company, all welding has been done by the standard R. W. & B. process.

For making comparative tests it was decided to use the so-called hand-feed process in welding. In this, the operator holds a welding rod in one hand and in the other a carbon electrode. After striking the arc on the seam to be welded, the end of the welding rod is fed into the arc. By this method it is possible to make a weld of any cross-section within certain limits by varying the quantity of weld metal fed into the arc. It was also decided to test a bevel head type of joint plate in order to compare the results with those from the flush head type of joint plate used on the previous tests.

An examination of the specimens after the tests were made showed that in some cases where the hand-feed process had been varied by laying a welded rod in place and feeding in extra metal from a second rod, the arc would not penetrate entirely through the rod in place.

100-lb. 6-in. Tee Rail—A.R.A. Type "A" Standard Joint Plates Top of Plates Beveled as shown



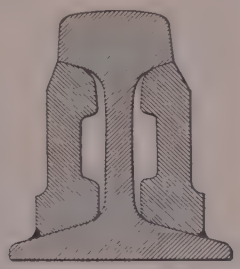
Specimen No. 40
No. of seams, 4.
Length of seams, 10 in.
Hand feed or puddled welds —1⅛-in. welding rod per lin. inch of weld.
⅜-in. R. W. & B. welding rod.
Volts, 27. Amp., 160.
Ultimate compression load, 509,300 lb.

Specimen No. 41
No. of seams, 2 top.
Length of seams, 10 in.
Hand feed or puddled welds —1⅛-in. welding rod per lin. inch of weld.
⅜-in. R. W. & B. welding rod.
Volts, 27. Amp., 160.
Ultimate compression load, 231,000 lb.

Specimen No. 42
No. of seams, 4.
Length of seams, 10 in.
Hand feed or puddled welds —1⅛-in. welding rod per lin. inch of weld.
⅜-in. R. W. & B. welding rod.
Volts, 27. Amp., 160.
Ultimate compression load, 431,200 lb.

Specimen No. 43
No. of seams, 4.
Length of seams, 10 in.
Hand feed or puddled welds —1⅛-in. welding rod per lin. inch of weld.
⅜-in. R. W. & B. welding rod.
Volts, 27. Amp., 160.
Ultimate compression load, 422,400 lb.

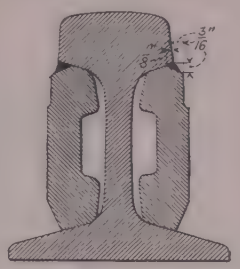
100-lb. 6-in. Tee Rail—A.R.A. Type "A" Standard Joint Plates



Specimen No. 44
No. of seams, 2 base.
Length of seams, 10 in.
Hand feed or puddled welds —1⅛-in. welding rod per lin. inch of weld.
⅜-in. R. W. & B. welding rod.
Volts, 27. Amp., 160.
Ultimate compression load, 257,000 lb.

Specimen No. 45
No. of seams, 2 base.
Length of seams, 10 in.
Hand feed or puddled welds —1⅛-in. welding rod per lin. inch of weld.
⅜-in. R. W. & B. welding rod.
Volts, 27. Amp., 160.
Ultimate compression load, 228,800 lb.

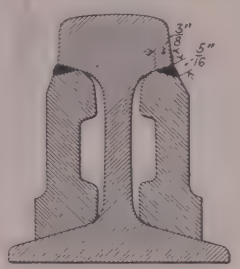
100-lb. 6-in. Tee Rail—A.R.A. Type "A" Standard Joint Plates Plates Bottom Side Up



Specimen No. 46
No. of seams, 2 top.
Length of seams, 10 in.
Standard process Carbon Arc weld—2 welds, second over the first.
⅜-in. R. W. & B. welding rod.
Volts, 35. Amp., 200.
Ultimate compression load, 247,500 lb.

Specimen No. 47
No. of seams, 2 top.
Length of seams, 10 in.
Standard process Carbon Arc weld.
⅜-in. R. W. & B. welding rod.
Volts, 35. Amp., 200.
Ultimate compression load, 226,600 lb.

100-lb. 6-in. Tee Rail—A.R.A. Type "A" Standard Joint Plates Top of Plates Beveled as shown

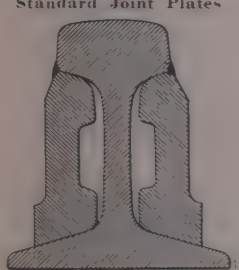


Specimen No. 48
No. of seams, 2 top.
Length of seams, 10 in.
Hand feed or puddled welds —1⅛-in. welding rod per lin. inch of weld.
⅜-in. R. W. & B. welding rod.
Volts, 25. Amp., 160.
Ultimate compression load, 264,000 lb.

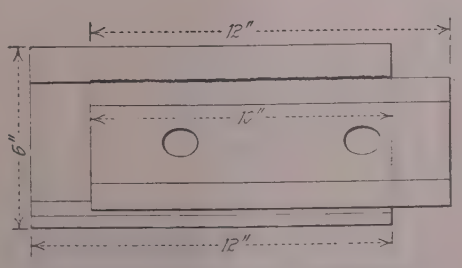
Specimen No. 49
No. of seams, 2 top.
Length of seams, 10 in.
Hand feed or puddled welds —1⅛-in. welding rod per lin. inch of weld.
⅜-in. R. W. & B. welding rod.
Volts, 25. Amp., 160.
Ultimate compression load, 236,500 lb.

Specimen No. 50
No. of seams, 2 top.
Length of seams, 10 in.
Hand feed or puddled welds —1⅛-in. welding rod per lin. inch of weld.
⅜-in. R. W. & B. welding rod.
Volts, 27, Amp., 150.
Ultimate compression load, 242,000 lb.

100-lb. 6-in. Tee Rail—A.R.A. Type "A" Standard Joint Plates

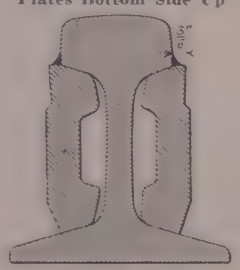


Specimen No. 51
No. of seams, 2 top.
Length of seams, 10 in.
Standard process Carbon Arc weld.
⅜-in. R. W. & B. welding rod.
Volts, 35. Amp., 200.
Ultimate compression load, 191,400 lb.



SIDE ELEVATION OF SPECIMEN

100-lb. 6-in. Tee Rail—A.R.A. Type "A" Standard Joint Plates Plates Bottom Side Up



Specimen No. 52
No. of seams, 2 top.
Length of seams, 10 in.
Hand feed or puddled welds —1⅛-in. welding rod per lin. inch of weld.
⅜-in. R. W. & B. welding rod.
Volts, 27. Amp., 160.
Ultimate compression load, 260,700 lb.

Fig. 3—Comparison of Groove and "V"-Bevels

This occurred with specimens 20, 22, 25 and 29. In the case of specimen 31 it was found that the ends of the joint plates were uneven so that the strain was applied to one plate only.

As bevels "A" and "C" appeared more promising for further tests, eight specimens were prepared and sheared, with the ultimate load data given in Table II.

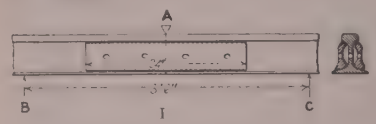
From this series of tests it appeared that as good results are obtainable with bevel "C" as with bevel or groove "A," the latter being too large a cavity to fill with welding metal with no corresponding appreciable gain in the strength of the weld. Some question exists as to the accuracy of the high strength figure secured by the carbon arc process followed by the metallic process (specimen 39, see table II), because an examination of the specimen after testing showed one of the joint plates had bent slightly inward and bound against the end of the rail, increasing loading to a certain extent.

GROOVE VS. "V"-BEVEL

The next set of tests, Fig. 3, was made for the purpose of comparing a groove applied to the top of the joint plate as shown in specimens 40, 41, 42 and 43 with a "V"-bevel as shown in specimens 48, 49 and 50. With one exception these tests were made with the hand-feed process. The exception was made with flush-head plates

Case I

6-in. Tee Rail, 100-lb. A.R.A. Type "A," Std. Joint Plates 24 in. long, seam welded full length. Bevel "A."



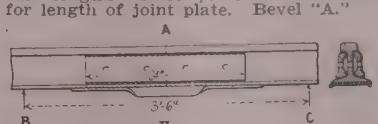
Rail supported at "B" and "C"

Load applied at "A"	Deflection in inches
5,000 lb.	.00
25,000 lb.	.06
50,000 lb.	.15
60,000 lb.	.26
65,000 lb.	See below

One joint plate broke at 65,000 lb. and test was discontinued.

Case II

6-in. Tee Rail, 100-lb. A.R.A. Type "A," Std. Joint Plates 24 in. long, seam welded full length. Base plate seam welded for length of joint plate. Bevel "A."



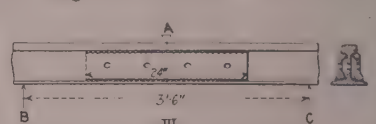
Rail supported at "B" and "C"

Load applied at "A"	Deflection in inches
5,000 lb.	.00
25,000 lb.	.03
50,000 lb.	.07
75,000 lb.	.13
100,000 lb.	.19
120,000 lb.	.25
140,000 lb.	.34
144,250 lb.	See below

At 144,250 lb. rail broke at end of joint plate and test was discontinued. All welds in perfect shape. Base plate slightly deflected at point of rail fracture.

Case III

6-in. Tee Rail, 100-lb. A.R.A. Type "A," Std. Joint Plates 24 in. long, seam welded full length. Bevel "C."



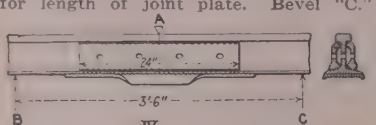
Rail supported at "B" and "C"

Load applied at "A"	Deflection in inches
5,000 lb	.00
25,000 lb.	.04
50,000 lb.	.11
60,000 lb.	.22
65,000 lb.	.28
99,700 lb.	See Below

One joint plate broke at 99,700 lb. and test was discontinued. Slight distortion in welds at point of joint plate fracture.

Case IV

6-in. Tee Rail, 100-lb. A.R.A. Type "A," Std. Joint Plates 24 in. long, seam welded full length. Base plate seam welded for length of joint plate. Bevel "C."



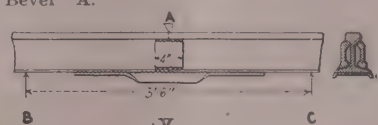
Rail supported at "B" and "C"

Load applied at "A"	Deflection in inches
5,000 lb	.00
25,000 lb.	.02
50,000 lb.	.07
64,250 lb.	See below

At 64,250 lb. rail broke 1 in. inside of joint plate base plate and test was discontinued. Base plate slightly deflected at point rail fracture. No fracture in seam welds.

Case V

6-in. Tee Rail, 100-lb. A.R.A. Type "A," 2 pcs. std. joint plate 4 in. long with base plate. Seam weld full length. Bevel "A."



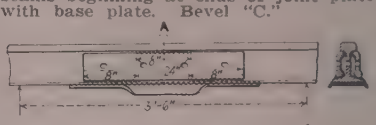
Rail supported at "B" and "C"

Load applied at "A"	Deflection in inches
5,000 lb.	.00
25,000 lb.	.03
50,000 lb.	.07
75,000 lb.	.13
105,000 lb.	.19
125,000 lb.	.38
135,000 lb.	See below

Complete failure at 135,000 lb. rail broke 3 in. inside of end of base plate welds. Base plate slightly deflected at point of rail fracture.

Case VI

6-in. Tee Rail, 100-lb. A.R.A. Type "A," Std. Joint plates 24 in. long. Seam weld 8 in. top seam at joint 8 in. base seams beginning at ends of joint plate with base plate. Bevel "C."



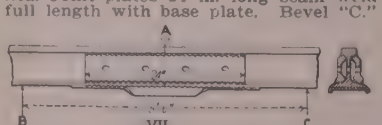
Rail supported at "B" and "C"

Load applied at "A"	Deflection in inches
5,000 lb.	.00
25,000 lb.	.03
50,000 lb.	.07
75,000 lb.	.11
105,000 lb.	.16
125,000 lb.	.26
135,000 lb.	.35
140,000 lb.	See below

Test discontinued at 140,000 lb. Rail broke 1 in. inside end of joint plate at end of base weld. Base plate slightly deflected at point of rail fracture.

Case VII

6-in. Tee Rail, 100-lb. A.R.A. Type "A," Std. Joint plates 24 in. long seam weld full length with base plate. Bevel "C."



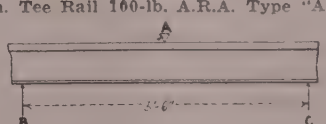
Rail supported at "B" and "C"

Load applied at "A"	Deflection in inches
5,000 lb.	.00
25,000 lb.	.04
50,000 lb.	.07
67,200 lb.	See below

Test discontinued at 67,200 lb. Rail broke 1 in. inside of joint plate.

Unbroken Rail

6 in. Tee Rail 100-lb. A.R.A. Type "A."



Rail supported at "B" and "C"

Load applied at "A"	Deflection in inches
5,000 lb.	.00
25,000 lb.	.03
50,000 lb.	.07
75,000 lb.	.11
100,000 lb.	.16
125,000 lb.	.22
150,000 lb.	.40
160,000 lb.	.51

Test discontinued at 160,000 lb.

6 in. Tee Rail 100-lb. A.R.A. Type "A."

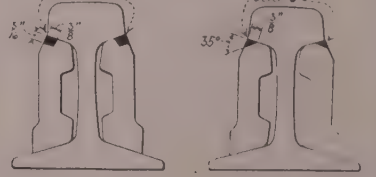


Fig. 4—Bending Tests to Failure of Arc-Welded Joints

TABLE I—STRENGTH OF WELDED JOINTS 2 AND 4 SEAMS

Spec.	Rail Sec.	Joint Plate	Bevel	Number of Seams	Length of Seams	Weld Steel	Process	Ultimate Comp. Load
1	6 in. tee	Std.	No	4	10 in.	9/32 in. Gr. 10	Carbon	464,200 lb.
2	6 in. tee	Std.	No	4	10 in.	9/32 in. Gr. 10	Carbon	490,600 lb.
3	6 in. tee	Std.	No	4	10 in.	5/32 in.	Metallic	301,400 lb.
4	6 in. tee	Std.	No	4	10 in.	5/32 in.	Metallic	336,600 lb.
5	6 in. tee	Std.	Yes	4	10 in.	3/8 in. top 9/32 in. base	Carbon	375,100 lb.
6	6 in. tee	Std.	Yes	4	10 in.	3/8 in.	Carbon	233,200 lb.
7	6 in. tee	Std.	Yes	4	10 in.	3/8 in.	Carbon	283,800 lb.
8	6 in. tee	Std.	No	4	10 in.	5/32 in.	Metallic	378,400 lb.
9	6 in. tee	Std.	No	4	10 in.	9/32 in. Gr. 10	Carbon	411,400 lb.
10	6 in. tee	Std.	Yes	4	10 in.	3/8 in.	Carbon	242,000 lb.
11	6 in. tee	Std.	No	2 top	10 in.	3/8 in.	Carbon	220,000 lb.
12	6 in. tee	Std.	Yes	2 top	10 in.	3/8 in.	Carbon	138,000 lb.
13	6 in. tee	Std.	No	2 top	10 in.	5/32 in.	Metallic	169,400 lb.
14	6 in. tee	Std.	No	2 base	10 in.	9/32 in. Gr. 10	Carbon	242,000 lb.
15	7 in. Gir.	Flat plate 1 in.	No.	4	10 in.	9/32 in. Gr. 10	Carbon	464,000 lb.
16	7 in. Gir.	Std.	No.	4	10 in.	9/32 in. Gr. 10	Carbon	369,000 lb.
17	7 in. Gir.	Std.	No	4	10 in.	9/32 in. Gr. 10	Carbon	424,000 lb.
18	9 in. Gir.	Flat 1 in. plate	No	4	10 in.	9/32 in. Gr. 10	Carbon	270,600 lb.
19	9 in. Gir.	Std.	No	4	10 in.	9/32 in. Gr. 10	Carbon	400,400 lb.

Average ultimate load sustained by specimens Nos. 1, 2, 5, 6, 7, 9, 10 (Carbon arc) ..... 357,186 lb.
Nos. 3, 4, 8 (Metallic) ..... 338,800 lb.

Area of 4 seams (carbon arc) = 4 x .25 sq.in. x 10 in. = 10 sq.in.

Unit stress (shear) on seam metal $\frac{357,186 \text{ lb.}}{10} =$ 35,718 lb. per sq.in.

TABLE II—ULTIMATE LOAD DATA FOR TWO BEVELS

Spec.	Rail Sec.	Joint Plate	Bevel	Number of Seams	Length of Seams	Weld Steel	Process	Ultimate Comp. Load
32	6 in. tee	Std.	A	2 top	10 in.	9/32 in. Gr. 10	9/32 in. rod hand fed in	314,600 lb.
33	6 in. tee	Std.	A	2 top	10 in.	9/32 in. Gr. 10	9/32 in. rod laid in place 9/32 in. rod puddled in	209,000 lb.
34	6 in. tee	Std.	A	2 top	10 in.	9/32 in. Gr. 10	9/32 in. rod and 5/32 in. rod	268,400 lb.
35	8 in. tee	Std.	A	2 top	10 in.	9/32 in. Gr. 10	5/32 in. rod laid in place 9/32 in. rod puddled in	231,000 lb.
36	6 in. tee	Std.	C	2 top	10 in.	9/32 in. Gr. 10	9/32 in. rod puddled in	301,400 lb.
37	6 in. tee	Std.	C	2 top	10 in.	Gr. 10	5/32 in. rod laid in place 9/32 in. rod puddled in	158,400 lb.
38	6 in. tee	Std.	C	2 top	10 in.	Gr. 10	5/32 in. rod welded by carbon arc process followed by 5/32 in. rod metallic process	231,000 lb.
39	6 in. tee	Std.	C	2 top	10 in.	Gr. 10	9/32 in. rod welded by carbon arc process followed by 5/32 in. rod metallic process	382,800 lb.

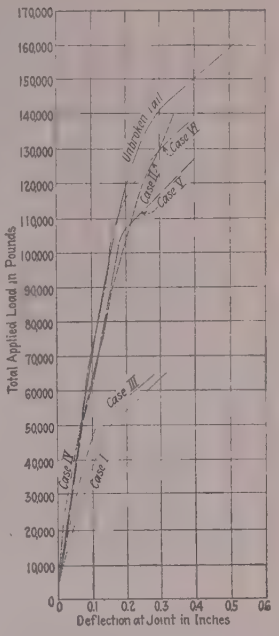


Fig. 5 — Load-Deflection Curves for Arc-Welded Joints and Unbroken Rail

and welded by standard process to check a previous test. Specimens 46, 47 and 52 were made with top seams only, the plates having a special bevel or ledge or combination of the two; also bevel "A" was modified in specimens 40, 41, 42 and 43 by making the groove smaller and so requiring less metal to fill the weld.

Specimens 46, 47 and 52 were made and tested at the request of the Rail Welding & Bonding Company, which furnished the details of the top bevel of the joint plate. To comply with this request it was necessary to use the standard joint plates bottom-side up in order to provide sufficient metal to form a groove or ledge as shown. The Rail Welding & Bonding Company desired these three tests to compare the merits of the hand-feed or puddled method to the standard process carbon arc weld. In each case the data as regards the energy consumption and welding rod used are given.

TABLE III—COMPARISON OF HAND-FEED AND STANDARD PROCESS METHOD OF ARC WELDING

Hand-Feed Process Welds	Pounds
Two top seams, "V" bevel, average load six specimens	264,916
Two top seams, groove, average load three specimens	262,166
Two base seams, average load two specimens	242,500
Four seams (two top and two base) average load three specimens	454,300
Standard Process Carbon Arc Welds	
Two top seams, no bevel, average load three specimens	193,600
Two base seams, average load, one specimen	242,000
Four seams (two top and two base) average load six specimens	397,100

The testing of specimens 46, 47 and 52 as varied somewhat from the Rail Welding & Bonding Company's instructions. These were to the effect that with the bevel shown in specimens 46 and 47 one weld should be made with the hand-feed process and one weld with the standard R. W. & B. process double weld, the standard R. W. & B. process being used with plates as shown with specimen 52, but in order to compare the single and double methods of welding, standard process, it was decided to apply this test to plates having the same bevel in order to get comparative values and the hand-feed process was used with specimen 52.

Summary of Compression Shear Tests

In analyzing and reclassifying the results of the entire series of compression shear tests to date, a comparison of the hand-feed and standard process method of arc welding gives the results shown in Table III.

Taking the average load of the four-seam specimen with V-bevel top seams, hand-feed process, and adding a value for the addition of a rail-joint base plate equal to the load sustained by the two seams, and using the result obtained as a basis of computation, a full-length joint of the same rail section as the test specimen, with standard joint plates, top of plates "V" bevel, with rail-joint base plate and all weld seams 22 in. long, should stand a tension strain of approximately 760,000 pounds.

Cross-Bending Tests

Cross-bending tests on full-size joint specimens were made to determine the value of a base-plate added to a seam-weld joint. The data on these tests are shown in Fig. 4, the joints being deflected to the breaking point in each case. For comparison, a deflection test was also made on an unbroken rail as shown, until a maximum deflection of 0.51 in. was reached, the load then being 160,000 lb. All these rail sections were uniform, a 100-lb., 6-in. tee being used with various bevels at the joints as indicated.

The details of the joint make-up were as follows:

Welds were made by the hand-feed process. The weld metal was R. W. & B. $\frac{5}{32}$-in. rod, grade 10, and

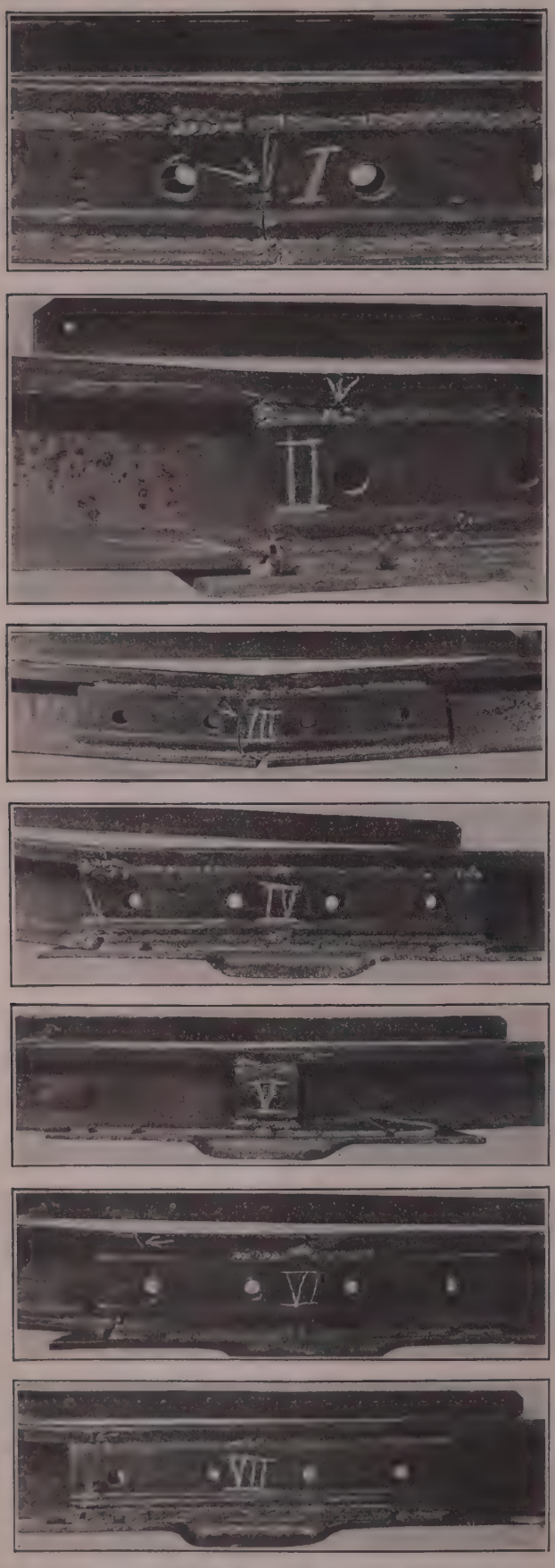


Fig. 6—Appearance of Arc-Welded Joints of Fig. 4 After Failure. The Number of the Specimen Is Shown in Chalk Marks on the Rail Section

approximately 1½ in. of rod was used per linear inch of weld. The power requirement was 125 amp. at 25 volts. All seam welds 24 in. long were equal to the length of the joint plates.

An examination of the joints after testing showed that the only fracture of the seam welds was at the point of rail failure and in no case was any distortion shown between rails and joint plates or between rail and base plates. Also, the deflection in the base plates occurred only at the point of rail fracture.

The relation between deflection and loads is shown in Fig. 5, and Fig. 6 shows the appearance of the joints in Cases I to VII, in Fig. 4, after being broken, to show where failure occurred.

Employees' Funds Total Nearly $2,000,000

Philadelphia Rapid Transit Company Employees Have Four Funds from Which Their Various Activities Can Be Financed

THE employees of the Philadelphia Rapid Transit Company have a co-operative savings fund, a co-operative benefit fund, a co-operative wage dividend and a co-operative helping hand fund. Each of these is for a different purpose, and the securities in each are kept entirely separate.

Co-operative Savings Fund

The purpose of this fund is, as its name implies, to provide an agency for the investment of savings. This fund was established in 1919. There are 7,572 depositors, having an average deposit after three years of $235. Much of this saving has come through the practice of the employees signing an order on the treasurer of the company to make a specified payroll deduction and deposit the amount in the savings fund. Deposits may be withdrawn upon two weeks notice, or in a shorter time when actual emergency is shown. The interest period is 5 per cent, made possible by the purchase of large blocks of securities during the post-war period. The interest paid on depositors' accounts during 1922 was $77,473. The investments composing this fund are as follows:

Par Value		Cost or Book Value
$218,650	U. S. Government and Federal Land Bank securities	$214,204.47
50,000	Real estate mortgages	50,000.00
465,000	Steam railroad bonds	454,350.00
422,000	Equipment trust certificates	417,439.98
661,000	Public utility bonds	656,642.50
$1,816,650	Total investments	$1,792,636.95
	Cash on hand	3,667.37
	Total securities and cash	$1,796,304.32

Co-operative Benefit Fund

The co-operative Welfare Association has a membership of 9,784, or 99.89 per cent of all P. R. T. employees. Its affairs are administered by the Co-operative Council, which also passes upon the validity and merit of all applications for pensions. This association is the medium through which sick benefits, pensions and life insurance policies are paid. The dues are $1 a month for a member, and the company contributes $1 for each dollar paid by the men, with a minimum of $10,000 a month.

Sick benefits are provided at the rate of $1.50 per

day, for a period not to exceed 100 days in any consecutive twelve months. Pensions of $40 a month are payable to incapacitated employees who have reached sixty-five years of age and have been continuously in the service for twenty-five years. Life insurance is covered by a group contract made with the Metropolitan Life Insurance Company, and each member has a separate insurance policy for $1,000.

It was from the surplus funds of this association that the employees purchased early in 1922 10,000 shares of P. R. T. stock. The report of receipts and expenditures for 1922 are as follows:

Cash balance—Jan. 1, 1922		$9,775.59
Receipts		
P.R.T. contribution ($10,000 per month)	$120,000.00	
Membership dues	117,887.00	
Interest and advances	56,182.60	
Securities sold	223,229.00	
		517,298.60
		$527,074.19
Expenditures		
Life insurance premiums	$127,373.22	
Pensions	70,038.70	
Sick benefits	59,241.75	
Wages and other expenses	25,498.40	
Purchase of 10,000 shares P. R. T. stock	238,330.95	
		520,483.02
Cash balance—Dec. 31, 1922		$6,591.17

Co-operative Wage Dividend Fund

This fund is the result of an agreement by which the management of the company agreed to pay the employees at the end of 1922 a bonus or "co-operative wage dividend," equal to 10 per cent of the annual wage earned by each, provided the company earned the sum required for such payment in addition to the amount required to pay the annual 6 per cent dividend on the $30,000,000 of P. R. T. paid in capital. Exclusive of this dividend, the basic hourly wage of the men is 62½ cents an hour.

The trustees of this fund are selected by the men from among their number, and 99.9 per cent of the employees signed orders instructing these trustees to use this fund for the purchase of P. R. T. stock. In 1922 ten thousand shares were first bought by the trustees, then 55,000 shares of stock were purchased and paid for out of the 1922 co-operative wage fund, making a total of 65,000 shares owned. Later 35,000 shares were purchased with money borrowed from the banks by the trustees of the co-operative wage dividend fund.

Certificates of participation in the stock owned are issued to individual employees. Such a certificate, at the time that 65,000 shares were owned, reads as follows:

65,000 shares Cost $1,650,000

Certificate of participation in 65,000 shares, Philadelphia Rapid Transit Company stock, held by the trustees, co-operative wage dividend fund.

This certificate is issued to and entitles..... while an employee of the company to 2½ per cent quarterly dividends, payable Jan. 31, April 30, July 31 and Oct. 31, upon the shares represented by this certificate, as long as the 6 per cent Philadelphia Rapid Transit dividend is paid.

Upon leaving the service of the company the owner of this certificate, or, in case of death, the owner's beneficiary, will receive at the option of trustees the shares represented by this certificate or cash to the amount of $30 per share for each share or fraction of a share thereof. By authority contained in resolution of Co-operative Committee, ratified by convention of all employers and employees' committeemen, the voting power of this stock is lodged in the trustees.

Dec. 30, 1922. This certificate is not transferable.

It will be seen that the employees own 100,000 shares out of 600,000 or one-sixth of the total capital stock of the company. The stock has a par value per share of $50, but is selling in the market for about $30 a share.

Co-operative Helping Hand Fund

This fund was organized in September, 1922, and is known as the Co-operative Helping Hand Fund. It was started to cover extreme and unusual cases of misfortune, where immediate financial assistance is necessary, as where a number of members of a man's family become seriously sick at one time. Here a loan scarcely answers, since the amount required would appear in the future to the employee an almost impossible barrier to a return to healthy financial condition. This fund has been made up by the payment into it of the profits of the annual picnic, $12,286, with $5,000 from the sale of the Philadelphia trolley route map, $6,000 from a benefit entertainment conducted by the men, and $1,000 from a helping hand tax of 5 cents per pound on the 15 tons of Christmas candy purchased by the men.

Pacific Electric Operates New Cars

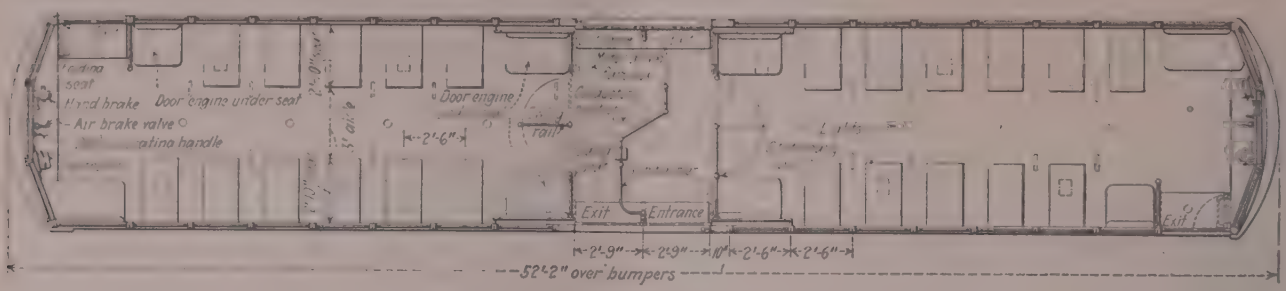
FIFTY all-steel suburban type cars have just been shipped by the St. Louis Car Company to the Pacific Electric Company for use between Los Angeles and Hollywood. In the construction of the cars special attention was paid to their operation in trains, and they were provided with center sills capable of taking the pulling and buffing stresses incident to train operation. The center sills have an area of 8 sq.in. and the area of all longitudinal sills is 13 sq.in.

The floor system is supported on drawn steel members and consists of a light gage corrugated steel false floor riveted to the longitudinal members. Between the false floor and the main floor flaxlinum insulation is placed.

Wide Aisle and Seats and Center Entrance Are Features

The main floor is constructed of No. 22 gage Chanarch with Flexolith to a total depth of 1 inch.

The side frame is of the girder type with rolled tees for posts and patent leveled steel sheathing. The arch roof is No. 16 sheet steel with three-ply salamander insulation attached to the underside. The joint between roof sheets is made by flanging and gas welding the sheet be-



Floor Plan of Pacific Electric Cars

tween the angle carlines. The ceiling is of ¼-in. Agasote. The trucks are the St. Louis Commonwealth cast-steel equalized type. The adoption of the cast-steel frame is expected to reduce maintenance costs, as the side frame and transom are a one-piece steel casting. All joints between longitudinal and cross-members are fastened, which obviates the possibility of the truck getting out of square. The cars weigh completely equipped but 27,000 lb.

The cars have two doors at the center for entrance and exit and end doors at diagonally opposite corners for exit. The railing construction at the center is such that it can be swung to different positions so as to provide for great flexibility in connection with fare collection and the handling of crowds at terminals. The plan of operation is somewhat unique in that the forward portion of the car can be used as a pay-as-you-pass or as a prepayment section. The rear portion of the car is always used as a prepayment section. The pipe barrier at the center, which extends crosswise of the car from between the doors, is movable. Additional pipe barriers at each edge of the center portion can be swung 180 deg. and can be stopped and locked at either the right or left-hand side of the car or on the center line of the car. At terminals the platform barriers are swung parallel with the center line of the car and both center doors are used as exits. With the barriers swung to the left of the car, passengers are permitted to enter the forward portion without paying fare. This can be collected afterward, either from the passengers as they are seated or as they leave the car. This method is used only where large crowds are gathered. When operated in trains the end door of the first car is operated by the motorman for exit only.

The cars are equipped with four 50-hp. motors and provision is made for operating singly or in two and three-car trains.

High Efficiency of Boiler Fed with Pulverized Coal

THE United States Bureau of Mines has issued a preliminary statement covering tests of one of the boilers in the Lakeside station of the Milwaukee Electric Railway & Light Company. This is one of eight boilers equipped with the Lopulco pulverized coal system, supplying steam to two 20,000-kw. steam turbines. The complete installation in the Lakeside station was covered in an article in the issue of the ELECTRIC RAILWAY JOURNAL for April 15, 1922, page 633.

These tests were carried out by the fuel section of the Bureau of Mines, in co-operation with the research

New Pacific Electric Cars Are Arranged for Train Operation

department of the Combustion Engineering Corporation. The object of the tests was to determine the thermal efficiency, ease of operation and other particulars of a boiler with especially designed furnace and burners for burning pulverized coal. The boiler tested has 13,380 sq.ft. of heating surface.

Twenty-six tests were run at rates of heat transference varying from 4,000 to 8,000 B.t.u. per square foot of boiler heating surface per hour. The mean thermal efficiency attained was about 84 per cent, based on the gross calorific value of the fuel as fired. The efficiency varied little with the rate of steaming, and its high value is accounted for by the small loss from incomplete combustion and the small amounts of excess air, which varied from 5 to 36 per cent.

The coal burned had a gross calorific value of about 11,500 to 12,800 B.t.u. per pound and contained 2 to 5 per cent moisture, 33 to 36 per cent volatile matter and 9 to 13 per cent ash. It was so ground that 85 to 95 per cent would pass through a 100-mesh sieve. The ash had a softening point of 2,150 to 2,450 deg. F., but did not fuse together at the bottom of the furnace, because it was partly protected from the flame radiation by means of a series of water tubes connected to the boilers, which were placed between the furnace bottom and the flames.

The Readers' Forum

Saving Energy by Training Motormen to Handle Light Cars

ECONOMY ELECTRIC DEVICES COMPANY
CHICAGO, March 26, 1923.

To the Editors:

On page 515 of the ELECTRIC RAILWAY JOURNAL for March 24, in presenting my comments at the Illinois Electric Railway Association meeting when discussing the very interesting paper presented by C. E. Thompson of the North Shore on more comfortable rolling stock, your report might convey an impression contrary to my intent.

Comparing the energy consumption of a heavy interurban with the new light-weight type, I pointed out that the saving in car energy by the introduction of lighter interurban cars should be regarded from the same viewpoint as exists when older and heavier street cars are replaced by light-weight safety cars.

The safety car for city service ordinarily is designed for higher rates of acceleration and braking than were thought attainable when the old heavy street cars were built, and therefore, unless the motormen are instructed, and their methods of handling the controller and brakes are checked up, it is ordinarily found that full advantage of energy reduction through the use of the safety car is not realized. Of course there will come the characteristically lower consumption due to less weight, but there is also a worth-while saving to be made additionally if the motormen are properly trained to take full advantage of the higher rates of acceleration and braking that can be maintained with the safety car.

I desired also to leave the impression that with the newer forms of motors, control and brakes, a heavy type of interurban car could be operated with less energy consumption than the older type cars of the same weight, and likewise there was always available a further reduction for those roads which instructed and checked their men with a view to energy saving. I concluded my discussion of the Thompson paper with the statement that it was refreshing to have advanced ideas set forth at a convention by the representatives of a property which not only had thought out new things but had put them into successful practice.

L. E. GOULD, President.

The College Man in the Transportation Department

WORCESTER, MASS., March 17, 1923.

To the Editors:

Your editorial in the issue of March 10 on "A Place for College Men in the Transportation Department" brings forcibly to my mind the fable of the mouse that proposed to bell the cat; i.e., how do you expect the engineer to connect in the first place?

I grant your statement that this is almost a virgin field, but disagree with you entirely on the willingness of the young engineer to enter this department. With a few conspicuous exceptions, the engineer is not wanted there. Moreover, most railroad executives, having come up from the ranks, and being accustomed to dealing with organized labor, apply the seniority system too extensively. The young engineer, finding many inferior men ahead of him, and continually beset with ignorance, prejudice and custom, naturally gravitates toward less onerous conditions and greater opportunity.

Would it not be fairer to the young men about to graduate to point out to them the greater opportunities with the equipment and specialty manufacturers? Railroading in any department is fascinating work, but most of the railway engineering is done by the manufacturers, and most roads want "practical," that is, platform men only, as operating officials.

ROBERT G. TRUMBULL.

Question is made of how the engineer can be expected to fit in the transportation department. The JOURNAL stakes its faith in the young engineer rather than in the young college man with an A.B. degree, because the engineering training will enable the young man to understand how the tools used by his department to produce the thing he sells are subject to and must be adjusted with the requirements of the mechanical, track, power and line departments—all engineering in nature. Furthermore, the matter of graphing schedules and fitting service to traffic is one that will be readily understood by the engineer, but might be quite a problem for the unscientific mind.

Referring to the second paragraph of Mr. Trumbull's letter, this is all granted as a fact, but this is all the more reason that the subject should be discussed in order that railway men may give consideration to the fallacy of this situation and encourage new blood to enter the transportation department, and then to give it opportunity. One young college man lost heart in the transportation department because he was curtly informed that changes were not wanted; that the kind of men who were desired were those who were willing to carry on things as they are, not change them.

As to whether it would be fairer to the young men to direct their attention to opportunities with the equipment and specialty manufacturers is a question. It is

believed that the opportunity is distinctly great in the transportation department, provided that managements would give the same consideration in building up the personnel in this department that they have in others. If we were to admit that present conditions could not be remedied, then the JOURNAL would agree with Mr. Trumbull about the opportunity with the manufacturers, but the unsatisfactoriness of present transportation department methods and thinking is the very reason for calling attention to (1) the need for the railways to better the transportation personnel and (2) the opportunity for college men in that department.

—EDITORS.

About the Detroit Bulletins

MOUNT VERNON, N. Y., March 27, 1923.

To the Editors:

Socrates, as the wisest of mankind, realized how hopeless it was to exchange gibes with the playwright Aristophanes. One who enters the lists with an editor is in much the same position because the editor has the first page and the last word. Still, I'll take the chance.

Your editorial of March 3 found fault with me for quoting the opinions of the engineers of the Department of Street Railways instead of my own with regard to the condition of the property when taken over. I let this absurdity pass because the thoughtful reader knows that a person engaged seven months after the event cannot turn back the hands of Time even to please an editor.

Your editorial of March 24 finds fault with me for having opinions which do not coincide with yours. This is far more painful to me, so I will crave your indulgence to answer each of the points raised:

1. *Loss of Car-Miles Due to Trolley Wire Breaks.*—When I was on the editorial staff, I wrote editorials on the relation between equipment defects and lost car-miles. They were not questioned then. Of course, a car may complete its run within schedule time even if there has been a wire break along the line, but it will complete that run with fewer nickels. Have the editors forgotten that there is a pretty lively motor bus company in Detroit and quite a number of jitneys? Just watch those one-every-minute trains pile up on Woodward Avenue for nothing more than an ordinary traffic control stop and then tell me that a break in the trolley wire is a bagatelle. Are you finding fault with a recommendation that only the best be used?

2. *Percentage of Straight, Two-Piece and Three-Piece Runs.*—You are aware that the runs in Detroit have the consent of the platform men. If you do not agree with me that the runs in Detroit show skill as well as a decent regard for the men, I will refer you to your issue for Oct. 2, 1920, carrying an article by Edward Dana, general manager Boston Elevated Railway, on "The Scientific Arrangement of Schedules." On page 651 Mr. Dana says: "In Boston, 60 per cent of the runs are completed within eleven consecutive hours and 40 per cent between eleven and fourteen outside hours." Furthermore, Mr. Dana in a communication in your issue of March 17 shows that Boston's efficiency in man-power is practically the same as Philadelphia's. Detroit is in good company.

3. *The Single-End or One-Armed Car.*—You say: "His severe condemnation of the single-end car would indicate that many operators of large properties are wholly incompetent." You might as well have said this about any other bad feature which the present generation of electric railway managers has inherited, not originated. In your abstract you have me suggesting the early general rebuilding of all cars and track layouts to double-end operation. I suggest that you reread the bulletin, realizing at the same time that the exigencies of abstracting in haste and for limited space did the original report unintentional injustices. There is similar evidence of haste in the reference to lowered morale under the Detroit United management. This referred only to the peak of the bickering period and not to the days of relative peace.

4. *The True Fare Is What the Passenger Pays.*—I was content to say that the true average fare in Detroit was 5.33 cents, but you will not have it so. You claim 4.03 cents for January, 1923, and thus fall into the very same error which I was satirizing in my series of "supposes" that led to the mythical fare of 3.86 cents. In your haste you overlooked my main point, viz., that when a person pays 5 cents for his ride on the originating car and 1 cent on the destination car his fare for the trip is 6 cents and not 3 cents. You believe in the dilution of the originating fare by the transfer; I don't. Just try to convince the Detroit passenger that his fare is 4.03 cents! Who's the publicity expert for Detroit now?

WALTER JACKSON.

The author of the above letter has read into the JOURNAL editorial in question some things that were not there. Issue might be taken with each point in his letter referring to the editorial, but this seems unnecessary. Referring to his criticism of "one-armed cars," however, it is perhaps pertinent to note that the last 200 cars bought by the Detroit Municipal system were of the single-end Peter Witt type.

The abstract was not prepared in haste and it is believed to be a fair epitome of the original report. We are glad to have Mr. Jackson set forth his views in greater detail as above, however, if he thinks an injustice was done in the abstract.—EDITORS.

Proposed Automatic Substation in Cleveland Will Be Economical in Cost

THE CLEVELAND RAILWAY COMPANY

CLEVELAND, OHIO, March 21, 1923.

To the Editors:

Please note an error in the heading of the third installment of my article on "Automatic Substation Experience in Cleveland" on page 447 of the March 17 issue of the JOURNAL. It is pointed out in the heading, among other things, that the cost of the proposed station is to be 40 per cent less than the present structures. This should read 60 per cent, because you will note in the first paragraph on page 480 that I stated that the buildings may be erected for less than 40 per cent of the cost of the present substations.

L. D. BALE,
Superintendent of Substations.

The substantial reduction in fares which came into force last autumn on the Liverpool (England) Tramways has resulted in a considerable increase in the number of passengers, but despite this there has been a reduction in receipts of about £2,000 a week.

Association News & Discussions

Wisconsin Utilities Convene in Milwaukee*

Gas, Electric, Accounting, Sales and Railway Sections Meet in First Annual Convention of Consolidated Associations—Education, Track Problems, Selling Transportation and Automobile Accidents Hold Interest of Electric Railway Men

MARKED by enthusiastic joint meetings, and by enlightening separate sessions, the first annual convention of the Wisconsin Utilities Association, the consolidation of the gas, electric and electric railway associations, was held in Milwaukee, Wis., on March 22 and 23. Over 400 members and visitors registered for the two-day session, while the banquet reservation of 375 was exceeded on Friday night, the second day of the session. The mornings of each day were devoted to joint sessions, while the afternoons were devoted to meetings of the separate sections. All of the speakers expressed enthusiasm in regard to the prosperity they have experienced in the past year and the outlook for the continuation of this prosperity, which the people of Wisconsin and its industries are now experiencing. Every paper read in the separate sessions of the convention was thoroughly discussed by operating men in a whole-hearted, generous manner indicative of the interest.

J. P. Pulliam, vice-president Wisconsin Public Service Corporation, Milwaukee, and president of the association, in his opening address on Thursday morning, declared that the prosperity of public utilities reflects the prosperity of the communities in which they serve. Continuing, Mr. Pulliam said that there was more gas manufactured and more electricity generated last year than a year ago, despite the handicap of the coal strike and the continuous high cost of materials and labor. The public utilities of Wisconsin will spend between $25,000,000 and $30,000,000 in additions and improvements to their plants during 1923, in order to enable them to keep abreast of the ever-increasing demand for utility service.

Referring to the street railway situation, Mr. Pulliam said in part:

There is a much more hopeful atmosphere with our street and interurban properties. While unfair bus competition is still in evidence, there is the realization that the public can only get dependable transportation through the electric field. New equipment is being purchased, trackage extended and rebuilt, to the end that our business can be properly served. We should not lose sight of the need of the feeder lines in the sparsely settled districts which can be properly served for the present by bus, and after development of the territory trackage can be provided. We have not always looked upon our transportation field and our obligations as clearly as perhaps we should, with the realization that we occupy the field and should serve it, and we should use the buses to take care of that territory which is in the building. Bus transportation has grown tremendously in the state during the past year and to and from those communities which are not adequately served by electric and steam transportation there no doubt will continue to be a demand for bus transportation. In territories where buses are operating in opposition to well established electric and steam transportation, and where the buses are favored by the lack of comparative taxation, injuries are being done to the established companies. The question of taxation, however, is being considered and in due time when the bus companies so operating are subject to the same taxation program that is now placed upon the established lines their existence will not be for long.

Mr. Pulliam urged the utility representatives present to use every means to make the public acquainted with the facts concerning their problems. A record of the amount of newspaper advertising used by utilities in Wisconsin shows a substantial improvement over last year. This advertising, in his estimation, is of direct benefit to the companies, and utilities can make no better investment than to tell their story to the public fairly and honestly.

A paper by F. E. Schornstein, district manager Wisconsin-Minnesota Light & Power Company, Eau Claire, which was read by another, because of the author's illness, urged all public utility officials to join every community movement that had for its object any civic movement for the welfare of the people.

Following the reports of the various officials of the association and two-minute reports on the activities, aims and problems of various committees, an election of officers for the ensuing year was held. Harold L. Geisse, secretary and general manager Wisconsin Valley Electric Company, Wausau, was elected president; Bruno Rahn, vice-president, and G. C. Neff, treasurer.

At the general session the second morning James P. Barnes, president Louisville Railway, addressed the gathering on the three great words of the public utility business, namely, Co-operation, Publicity and Service. This appears in abstract elsewhere in this issue. Following Mr. Barnes on the program of the morning, John B. Maling of New Haven, Ind., in a speech resounding with patriotism, loyalty and Americanism, outlined the origin and effect of class and freak legislation.

He exhorted business men to take the lead in combating the influence of the agitators, parlor socialists and bolsheviks.

Electric Railway Session

B. W. Arnold, manager Eastern Wisconsin Electric Company, Oshkosh, presided at the separate session of the electric railway section on both afternoons. In his opening address Mr. Arnold spoke of the advantages of having joint meetings with the gas and electric men and belonging to such an association as the Wisconsin Utility Association. While the Green Bay meeting, held last August, may have had more railway men in attendance than the present meeting, he felt that the advantages of the joint meeting were greater than those of the separate meeting. O. A. Broten, National Pneumatic Company, Chicago, presented a paper on the pneumatic operation of car doors and steps, which is abstracted elsewhere. Nels C. Rasmussen, in discussing Mr. Broten's paper, brought out the fact that while his original equipment had the door engine underneath the floor of the car, this has been changed to the inside to prevent freezing of the engine. An alcohol anti-freeze font and wick has also been placed between the intake and the reservoir, eliminating freezing almost entirely. Referring to Mr. Broten's figures on time saving with pneumatic doors, J. P. Barnes thought there should not be too much optimism about this. He pointed out that the only saving in time that counts is when it amounts to enough to make it possible to take a car off and still keep the desired headway. He felt that door engines should be considered more as a convenience than as an economy.

Training of Employees

Edward J. Blair, Chicago Elevated Railways, made a short talk on the subject of education of employees as conducted on the elevated properties. From his own early experience on the Elevated, Mr. Blair felt that a general education of the personnel was necessary. Being a representative of the educational committee of the American Electric Railway Association, he explained in some detail the report of this committee and encouraged the men to read it. The problem which is con-

fronting the Elevated is to provide executives of the future. Mr. Blair asked the delegates if they could tell who on their properties would make a good general manager ten to fifteen years hence. Oftentimes it has been necessary for companies to go outside to provide themselves with the proper executives. However, this is not the attitute taken by the educational committee of the A.E.R.A. nor the Chicago Elevated, for it is felt that effort should be made first to get men from inside the company. It is the desire of the Elevated to start what will be known as an "executive school," taking men from the ranks, not college men, and giving them a liberal education of from three to four years and then putting them into minor executive positions. Although it seemed at first easy to pick the men, it was later found to be very difficult, for after six months of inviting groups into the general manager's office, only three men were selected.

At these meetings in the general manager's office the young men are invited to give suggestions and talk freely about their work or about ideas they may have in regard to the elevated system as a whole. After the selections have been made and three or four years of schooling has been undertaken by the men, during which time they will spend from three to four months in the various departments, the company will then have on one hand the college man and on the other hand the practical man. This, Mr. Blair feels, will lead to a friendly rivalry or competition between the two groups of men and the company will have jobs for all men who wish to stay and rise up in the organization of the company. During this schooling of the practical men they will receive their regular salary. It has been estimated that this course of education will cost the company $45,000, part of which, of course, will be collected in actual work performed by the men during this time. Co-operation with trade schools in the matter of apprentices is familiar to all, but the speaker thought this work should be carried on with men from colleges and a closer co-operation established between railway men and the state universities. He stated that it was hardest to handle the education within the company's own organization, although this could be accomplished to some extent by company section meetings, meetings on accounting and economics, and lectures by some outside speaker. In closing Mr. Blair called upon the men to make a careful study of the personnel of their companies for the jobs, not of tomorrow, but of ten years from today.

Mr. Blair's talk was discussed by J. P. Barnes, who said that many problems on the Elevated of which Mr. Blair had spoken did not apply to his road. Most all of his labor was American, as it was mostly colored. However, a special training had to be carried on for the white boss. With the colored laborer only three generations out of slavery, a grave responsibility fell upon the white boss. Education, to Mr. Barnes, was comparable to a crop, it being necessary to make a thorough analysis of the soil in order to get the best results.

Every job, in his estimation, should be understudied and the best way to do this is to give each man a trial. He spoke of a concern in which every job, from the general manager down to the office boy, was understudied by the man next lower in position. Whenever a man was absent due to sickness or out of town, all that it was necessary to do was to hire an office boy. If one of the officials should die or leave the company all the hiring that would be necessary would be another office boy. This has been successfully carried on for a great number of years.

Mr. Barnes felt that the trouble lies to a great extent with the executives, as they fail to understand the personnel of the company and the people they serve. Oftentimes the executive pays too much attention to the men who ride in automobiles and not enough to those who are the habitual car riders. A plan has been carried out by the Louisville Railway to have at least two or three men in every association in the city, the company paying the dues. This has been very worth while. It has also served for the company, as a means of selection, as it has been very easy to find out who the men were that had initiative enough to get up and get into the discussions carried on at these association meetings. Plans are now under way whereby meetings will be held at the universities in Kentucky and talks will be made by officials to the political economy classes on utility work. Professors at these universities are very eager to have the executives speak to their classes.

Mr. Fox of the Griffin Wheel Company made a few remarks in line with Mr. Blair's paper. He suggested that the young and new men be used in cases of emergency, possibly not to do the work themselves, but at least to sit in and see what the man in charge did.

Practice on Requiring Deposits

A general discusion was then held on the question of fare collection on the one-man cars, especially interurban cars, particular stress being laid upon the question of deposits by employees. Mr. Blair remarked that a deposit was required from all employees on his property for badges, etc., and this amount was carried on the liability side of the books. Mr. Burke of the North Shore Line stated that no deposit was required at the time of issuing materials to the men, this being taken care of by the accounting department in the pay roll, as each man receives his pay five days after the period for which he is paid. In this manner the company would always owe the man enough to cover any loss of company property. Mr. Arnold remarked that his company gave the men $13 worth of tickets and $7.50 in change, and required no deposit.

A round-table discussion was then held on how to handle transportation for employees. Mr. Barnes said that his company gave a sixty-ride book to all employees who make use of the city lines. They do not carry employees on their badge. J. A. Phelan, Rockford, Ill., remarked that his line carries the employees on their badges. However, the families of the employees are not carried free. After five years of service an annual pass, which can be used on the city and the interurban lines, is given to all employees. A special pass is given to city shop men, office employees have a fifty-ride transportation book. He also stated that they do not carry firemen nor policemen.

Mr. Arnold, the chairman, then asked the meeting to discuss the question of handling fares and issuing transfers on the one-man cars. Mr. Phelan of Rockford remarked that fares are collected as the passengers enter the car and transfers are issued as they leave the car at transfer points.

Mr. Barnes said that he had tried all methods, but found that the most feasible plan is to issue the transfer at a transfer point when the passenger leaves the car. The motorman is instructed to make change only when the car is stopped. A railing has been provided to keep passengers away from the operator, as a very serious accident occurred due to a passenger interfering with the operator while the car was in motion.

At the second session of the electric railway section Alfred A. Oldfield presented a paper on track maintenance problems of interurban railways. This appears elsewhere in this issue. Details in regard to laying Hedley grade crossings, and cautions about crossings in general were taken up in discussion on Mr. Oldfield's paper by J. S. Hyatt, Chicago, North Shore & Milwaukee Railroad. He remarked that a very satisfactory, inexpensive grade crossing can be made up of 4-in. x 6-in. planks and the use of this Hedley oil and sand. It has also been highly satisfactory to use this same oil in sealing of macadam crossings in order to keep the rain from seeping in under the macadam and freezing.

Mr. Hyatt diverged a bit from the subject of road material and spoke briefly on the extermination of weeds along the interurban roadway. His road had found it highly profitable to maintain a car especially devised for the extermination of weeds by use of a caustic arsenic solution. This seems to be the most satisfactory and should be applied directly after a rain, about four times a year, the idea being to keep the weeds from going to seed.

F. W. Shappert presented a paper on soliciting traffic which appears in this issue. Br. Barnes, indicating the manner in which his property sold transportation, stated that he wrote a personal letter to every family on a particular line at some time or other during the year and this was followed by a personal call of some official. This

tended to foster a spirit of friendship and co-operation between the party served and the operating company. C. E. Thompson, Highwood, Ill., stated that selling transportation is largely a question of public relations.

Automobiles and Accidents

R. M. Howard urged the railway men to seek the co-operation of automobile owners in an effort to promote the safety of the public. An abstract of Mr. Howard's paper is presented elsewhere in this issue. According to Mr. Burke, North Shore Line, the proper education of operators and drivers, by telling them what can be done to prevent accidents, is the only thing that will lower the accident hazard. Mr. Simmons, North Shore Line, in charge of the city line in Milwaukee, stated that his company had made it a point to compliment good drivers. This suggestion was made by the employees' safety committee. A check is being made by this company on drivers who do or do not look as they cross the right-of-way. It is felt that the claim department will profit greatly by such statistical records.

C. Allen, Green Bay, stated that all employees in his corporation are on a safety bonus. Every accident prevented gives the man credit, while every accident is to his discredit. Drivers of trucks and pleasure vehicles in Green Bay are on the same basis as the operators of the street cars.

In Louisville the question of automobile accident prevention has been gone into on a large scale by President Barnes. Accidents are classified in three classes: Those in which the responsibility lies with the motorman, those in which there is a question, and those in which the driver is wholly responsible. These are plotted on a map showing the location of the accident and who was responsible. A safety man is sent around to the various carhouses for the purpose of giving short talks on safety and explaining the accident chart to the operators. When this campaign was inaugurated, the motormen were responsible for 50 per cent of the accidents, but this has been reduced to such an extent that in the last month the motormen were responsible for only 30 per cent of all automobile accidents. By paying the expenses of an extra clerk at the State House during the registration for state auto licenses, a pamphlet was inserted with each license to every auto driver cautioning him about street car accidents and giving him the first rules of safety. After each accident Mr. Barnes sends a personal letter to every witness thanking him for the time and interest given to the case.

Interurban Track Maintenance Notes*

By Alfred A. Oldfield
Engineer of Maintenance of Way and Overhead Construction
Eastern Wisconsin Electric Company, Sheboygan, Wis.

PROBABLY one of the most frequent problems of the average interurban property which includes city construction and open trackwork is to reclaim track in some paved street. I frankly admit that we are still looking for a satisfactory solution, not only from the point of view of reclamation but also of cost. Invariably it resolves itself into the old problem of joints.

Good drainage is the first essential. After trying many methods we finally adopted the booster, with simple joint plates. We then built up the cupped rail and so far the results have been satisfactory. This work costs on the average about $15 per joint, exclusive of repaving work.

Special Work

Whenever possible we build up our special work with an oxyacetylene welder. Soft steel is put on in thin layers and finished with a hard steel layer. We use a steel brush for cleaning before welding.

As the properties on which I am engaged are going to lighter equipment on city tracks we are generally specifying hard-center iron-bound construction for frogs, switches and mates, but in some cases have bought solid manganese. On railroad crossings our specifications call for bolted construction, open-hearth steel, and heat-treated bolts. On open track special work, our specifications generally follow the manufacturers' but also incorporate some of our own details.

On open track, curves from 6 deg. up are guarded. The flangeway is 1⅜ in. At 10 deg. the gage is widened ⅜ in. and the flangeway ⅞ in. This proportionate increase of flangeway is carried out to a maximum of 2⅜ in. Maximum widening of gage is ¼ in. On all city lines, curves are guarded, usually with a girder guard rail.

On the Oshkosh property we have kept our switches well drained and sparsely salted, and have not had any case of freezing. On our Sheboygan property the boxes were packed with grease, and oil was added periodically. Grease and oil collect too much sand and dirt. In future the former system will be followed. In this territory, where extreme cold weather is experienced, I consider that complete drainage of switches is a most necessary expense.

Paving

We are doing considerable concrete paving. Some of our past experience in Plymouth and Sheboygan has been disastrous, but I believe most of this failure was due to faulty track construction. We have recently installed on one of the approaches to the Eighth Street bridge at Sheboygan Dayton mechanical tie construction with a straight bar spot-welded to the web and base of the rail, and concrete pavement. On the opposite approach we installed wooden tie construction with bonded joints and standard angle bars, and also concrete pavement. We intend to build one-half mile of straight track this year in Oshkosh using Dayton ties and simplex joint plates with concrete pavement, and at the same time build one-half mile with cedar ties embedded in concrete with a concrete pavement.

Asphalt paving in contact with the rail has proved very unsatisfactory. The city engineer, the city superintendent of streets and my department are experimenting with various tarvia and other macadam fillers.

Track Maintenance Methods

On open trackwork where we are using all cedar ties, we have adopted a tie renewal program extending over six years. As the ties are put in each year a general resurfacing of the track is made. New ballast is used only where absolutely necessary. Last fall I experimented by taking a 2-in. raise on a mile of track, raising it on old ties and using no new ballast. So far it has held up, and today is much better than any other part of our track, including those sections where new ties were put in. At the time this track was raised no new ties were installed, although they were in very bad condition, but every spike was either replaced or reset. The track was entirely cleared of weed, good drainage given to the roadbed and the track was very carefully gaged. Considering the result obtained, we have decided to extend this experiment a little further and then add, say, 600 ties to the mile and gradually build up the ballast section. In five years' time our track again will be standardized, and during the process of rehabilitation it will be in good operating condition.

The main line turn-outs are to be entirely rebuilt. We have adopted a section 7040 split-switch turn-out with No. 9, 15 ft. frogs; 15-ft. switches with two adjustable rods; open side sockets with each point reinforced on one side with one stop; fourteen ½x6 in. slide plates with ⅝-in. pressed steel rail braces; two gage plates; six Morden adjustable rail braces; two gray iron heel blocks. Standard turn-out timbers are to be used.

Our switch lamps are electrically lighted from the trolley, the same contact being used for lighting telephone booths at each turn-out.

Until a few years ago I was very much opposed to the expense incurred in using chemicals for the destruction of weeds, but after making some very careful comparisons, I am fully convinced that it is cheaper to destroy the majority of weeds chemically. Where considerable rehabilitation of track is contemplated the weed killer is unnecessary, but for ordinary maintainance one and possibly two applications of weed killer during the year are very profitable.

The practice that we have adopted

*Abstract of paper presented before the Milwaukee convention of the Wisconsin Utilities Association, March 22-23, 1923.

for the construction of highway crossings on interurban tracks is to use 4 in. x 6 in. planks, with a 3-in. space between the planks in the middle of the track, this 3-in. space being filled up with macadam; a 12-in. plank is put on the outside of each rail. I find this more satisfactory than a full plank crossing, although the macadam filling requires some maintainance. I have recommended replacing old timber structures for culverts and bridges with reinforced concrete culverts or I-beam spans on concrete. I feel this expense is justified from the viewpoint of safety and maintenance.

On all our interurban tracks which originally were built with continuous joints, standard angle bars are being used, and concealed bonds are replaced by welded bonds wherever necessary.

The roadbed is considerably below standard, but it is gradually being standardized on a six-year program. The sub-grade is to be 16 ft., and particular attention is being paid to improvements in drainage, which undoubtedly will reduce maintenance cost.

The original curves are being spiraled, guard rails placed on all curves of 6 deg. or more and elevation given for 45 m.p.h.

Our standard rail section for all renewals is to be 70 lb. A.S.C.E. This has been decided upon with the advent of lighter equipment which is being purchased by our company. The new interurban safety cars weigh 34,500 lb.

Pneumatic Operation of Doors and Steps*

By O. A. Broten
Western Representative National Pneumatic Company, Inc., Chicago

THE advantages of pneumatic door control in street railway, elevated and subway transportation are indeed manifold, as every department is directly or indirectly benefited by them. This may sound like a very broad statement but I am sure you all will agree that it is *service* to the community that brings out the car riders. Pneumatic door and step control is a time-saving, labor-saving and passenger control safety apparatus, the use of which results in service to both the car rider and the railway company. For instance, the following figures, involving only the transportation and treasury departments, merely show what a few seconds actually mean in dollars and cents to the railway company. Pneumatic door control will actually save from one to five seconds per car stop, but using only an average of two seconds saved per car stop, we arrive at the following:

8	car stops per mile
2	seconds saved per car stop
16	seconds saved per mile
10	miles per hour
160	seconds saved per hour
18	hour car day
2880	seconds saved per day or
46	minutes saved per day or
7½	miles more car travel per day
30	cents average net revenue per mile
$2.25	additional net revenue per day
365	days
$821.25	additional net revenue per year

This would pay for pneumatic door control on quite a number of cars.

In addition to the advantages shown by these figures, the conductor is allowed more time for fare collection and passenger courtesies. He is relieved of considerable fatigue as his day draws on, helping to keep him fresh and alert for his contact with the public.

During the years when hand-operated door and step control was at its height, the hiring of platform employees was based to some extent on brawn; however, pneumatic control has eliminated this particular specification of man power, in that railway properties are now in position to employ platform men on the basis of cashiers and salesmen, with brains, common sense and personality more important than brawn.

Another important item is the matter of maintenance, which generally grows with the addition of apparatus. However, with pneumatic door control this has really been reversed. Pneumatic door engines operate the doors in exactly the same manner with each operation. Hand-operated doors are controlled entirely by the will of the platform employee and are subjected to considerable abuse throughout the day, which of course means that the doors and steps and the operating mechanism are made to suffer through excessive strain, breakage of levers, getting the mechanism out of adjustment, loosening the hinges, breaking the glass and various other such items. With pneumatic door control these items are practically eliminated.

Door engines are all manufactured with the door cushioning feature and adjustable speed. There are really three types of pneumatic control, viz., straight-pneumatic, mechanical-pneumatic and electro-pneumatic, each of which has its specific advantages for different types of operation. For remote control, or where the platform employee is stationed at some distance from the car door, electro-pneumatic control is the ideal operation. Where the operator is stationed closer to the door, either mechanical-pneumatic control or straight-pneumatic control would be the ideal operation, depending entirely on the exact features of door operation desired.

The matter of installation of pneumatic door engines is an item of considerable importance, as this affects the operation as well as the maintenance. With sliding doors the ideal location of door engines is on the car or platform floor, directly behind and adjacent to the door proper. On folding doors it is advisable to install the door engines in a header pocket above the doors, as this gives a direct connection to the door shaft, with the door engine and connections located in a position where dust and dirt will not collect.

Where there is not sufficient headroom to install a door engine above the doors the alternative is on the platform floor, using connecting rods and levers for transmitting motion from the engine shaft under the platform floor to the door and step shafts; however, any connections under a car are subjected to excessive wear. This brings out the point of installing door engines under the platform floor, which is without any recommendations whatsoever, as this materially reduces the life of the door engine because of the collection of sand and dust from the streets.

With reference to adjustment of door engines, as mentioned above, there was a time when all adjustments could be made from the outside of the door engine proper, but this proved so disastrous to the operating company that the adjustments were placed in such a position that the car crews could not regulate the doors themselves, which insures a uniform door operation, meeting with the approval of the responsible department and not of each individual platform employee.

Door engines can be adjusted to operate at almost any desired speed, governed by a safe door operation, and regardless of the size or the type of the door, with or without steps.

With reference to care of door engines, it is the experience of users that a general inspection and overhauling should be given the door engines at the same time that the periodical overhauling is given to the car in general, as every piece of apparatus placed on the car must have its required attention and overhauling.

I have experienced cases where door engines have been condemned because of sluggish operation, when upon investigation the difficulties have centered in the lack of proper lubrication, and scale and foreign substance in the air ports. It is simply necessary to clean out these air ports with the aid of crude oil, when the free air passage will bring new life to the door engine.

Pneumatic door and step control is the most flexible of any type of passenger control apparatus, in that almost any safety feature or any type of door operation can be secured by piping the door engine accordingly. For instance, the following features can be readily secured:

1. Doors cannot be opened until brakes are applied.
2. Release of brakes will automatically close doors.
3. Brakes cannot be released until doors are fully closed.
4. Doors cannot be opened until brakes are applied but can be closed at any time desired.
5. Through the use of pneumatic and

*Abstract of paper presented before the Milwaukee convention of the Wisconsin Utilities Association, March 22-23, 1923.

interlocking safety control it is impossible to have current at the controller until all doors are closed.

The question of door engine weight has often been discussed, and I might advise that considerable experimenting with dozens of different kinds of tests was done before we were fully satisfied that it was not feasible to use the aluminum type of door engine due to the extreme difficulty in securing a metal which would be airtight.

Some Pointers on Soliciting Traffic*

By F. W. Shappert
Traffic Manager
Chicago, North Shore & Milwaukee Railroad,
Chicago

MY CONCEPTION of a traffic manager's job is to sell transportation, to create a market for his goods where there is none, to analyze carefully local conditions and ascertain exactly what you have to sell, and then put up a strong, concise and convincing selling argument to prospective customers. To illustrate better, I will cite some specific cases of North Shore salesmanship.

Since the present management has taken hold of the North Shore Line we have greatly increased the number of chartered or special cars, which now amounts to several hundred special trains annually. Our traffic solicitors at Chicago and Milwaukee cultivate officials of various fraternal organizations, clubs, societies, etc., and arrange for reciprocal visits between such organizations as Kenosha, Racine, Milwaukee, Waukegan and Chicago. In every instance a representative of this office has accompanied the party to insure a comfortable trip. He actively mixes with the guests with a view of getting comments regarding the trip and is also keenly alert for tips regarding future pilgrimages and excursions. These tips are followed with extreme care to secure additional business.

Several years ago, when the writer first joined the North Shore staff, it was customary for a football captain or baseball captain to call up the office and arrange for a small party to some town along the line. Our solicitors now get in touch with the students of the various high schools, colleges and universities and write individual letters calling attention to the proposed game and work up enthusiasm that invariably produces chartered cars or special trains. I have in mind one of these trips, from the Lewis Institute, Chicago, to the Great Lakes Naval Training Station, which was increased in this manner from the original order of twenty round-trip tickets to 235 round-trip tickets.

Several years ago Jim Vaughn, a pitcher on the Chicago National League baseball team, was employed by the Nash motor works during the winter months. We arranged with the Chicago National League Baseball Club to have Vaughn pitch on a certain Saturday afternoon in May, and by securing the co-operation of the officials of the various manufacturing plants at Kenosha traffic was created in such volume that it was necessary to utilize fifteen cars to convey the party to Chicago and return.

We have been very successful in prevailing upon educators to make trips to various points on the line. During the past six years we have handled several thousand school teachers in chartered car trains.

The writer has successfully tried the experiment on several manufacturers of inviting students of engineering schools to make inspection tours to the large industrial plants at Kenosha and Milwaukee. The original trip called for a two-day schedule. This schedule has now been extended to an entire week and includes inspection of large plants at Gary, Ind.; Buffington, Indiana Harbor, Chicago Railway terminals, and Kenosha and Milwaukee plants. These trips are being taken by a number of the large universities throughout the central West. Last fall, through correspondence, we sold the idea to universities located 900 miles away from Chicago, with the result that various institutions and universities sent their engineering students over the North Shore Line for an educational trip. We handled eleven universities last fall and expect to increase this order to fifteen during the fall of 1923.

Some transportation lines merely cultivate the educators shortly before the convention or excursion, whereas this department cultivates these people twelve months in the year. In a number of instances this department has made hotel reservations, secured choice theater seats and made reservations for Pullman and parlor cars over steam rail lines for the party.

Our football business has greatly increased in the last few years due to the fact that we get directly in touch with the alumni and students of various schools and with the fraternities, giving them information on our superior service, dining cars, etc.

This department has arranged with the bar associations in various points in Illinois and Wisconsin and chambers of commerce for special trips and outings. In a great many instances our solicitors suggest to club officials that they invite their fellows to make reciprocal visits and our transportation department co-operates with the sales organization in making a pleasant trip which almost invariably results in new business.

About six years ago this department made an investigation at Winnetka as to why the school children didn't patronize the North Shore Line. One hundred and sixty inquiries by telephone developed the finding that 90 per cent of the parents refused to allow their children to patronize the North Shore because they thought it was not safe. Today we are getting 95 per cent of this business. This was accomplished largely through personal telephone calls, by which it was possible to convince parents of the extreme precautions to secure the greatest safety.

To sell transportation successfully it is absolutely necessary that close co-operation between the operating department and the traffic department be secured. It is impossible for a good traffic salesman to sell transportation unless the operating officials are awake to the fact that to increase earnings on a profitable basis it is necessary to render high-class service. High-class service includes operating trains on time, with thoroughly ventilated and clean cars and courteous, competent and neat appearing employees. Salesmen and ticket agents should be very careful not to misrepresent facts to the public, which is quick to resent misinformation. Selling transportation, in a good many instances, means selling a man his own mind. In other words, it means making a man want to believe what you want him to believe about your company. Elbert Hubbard once said that a man believes what he wants to believe. To make a man want to believe what you want him to believe is the art of selling transportation.

When an agent attempts to sell a prospective passenger a ticket he is not selling a piece of pasteboard. The pasteboard is not worth a small fractional part of the purchase price. The person holding the purchased ticket should have the feeling that his ticket guarantees a safe, comfortable and courteous trip to his destination. He should be made to feel that he has paid for a trip and is a guest of the company for the time that he is on the train. He should be thoroughly "sold." When he gets off the train he should feel greatly appreciative for the transportation that he has received.

The traffic salesman of your line has to sell complete trust and good will for his company. The holder of a ticket should be made to feel that he is entitled to more than merely a ride to destination. One satisfied passenger will sell more transportation to his friends in a week than a solicitor can in two weeks. Successful salesmanship means that a salesman should be able to understand human nature and adapt himself at all times to the moods of his prospective customer. This department is rather proud of the fact that the traffic staff has succeeded in building up a large list of satisfied customers, not only on the line but in cities located several hundred miles away from our line, and our distant friends boost the North Shore Line and greatly assist this department in selling the thousand-mile books and twenty-five-ride tickets as well as single fares. Through this medium we have greatly increased our passenger earnings.

*Abstract of paper presented before the Milwaukee convention of the Wisconsin Utilities Association, March 23, 1923.

The members of the Wisconsin Utilities Association are undoubtedly aware of the tremendous increase in the business of the North Shore Line during the past four or five years in handling merchandise. This campaign was started some five years ago by opening a small receiving station in an abandoned drug store at Sixth and Clybourn, Milwaukee. In the beginning we had some difficulty in convincing the merchants at Milwaukee that a trolley line could really handle merchandise. We overcame this prejudice by a persistent solicitation. Our solicitation force presented facts. We arranged to notify shippers and consignees of the superior North Shore service which, at that time, included prompt handling of merchandise from Milwaukee to Lake Bluff and points on the Area Division. After we had satisfied our Milwaukee friends that the North Shore could render a superior service, the management extended merchandise service to Evanston and later to Chicago. At the present time we are operating four receiving stations in Chicago and handling several hundred tons of merchandise daily on the system.

The North Shore is fortunate in having a president and general superintendent who are alive to the public needs, with the result that our solicitors are able to go out and sell North Shore transportation, which means the best service offered by any transportation line. Our damage claims are extremely low and our cost of transportation will bear most favorable comparison with any other common carrier.

The Problem of Collisions Between Cars and Automobiles*

By R. M. Howard
Vice-President Wisconsin Railway, Light & Power Company, Winona, Minn.

THE automobile has introduced an accident hazard of such magnitude that automobile-street car collisions now account for more than 50 per cent of the total street railway accidents in the state of Wisconsin.

The almost universal use of air brakes has minimized the collision hazard with pedestrians and horse-drawn vehicles, the folding door which prevents passengers from boarding or alighting while cars are in motion has almost eliminated the step accident, but we have not found any way to dodge the fast-moving automobile, so our accident records show a constant increase from year to year.

Statistics pertaining to this situation are presented herewith.

Wisconsin licenses issued during the past five years are as follows:

Year	Autos	Trucks	Motorcycles	Total
1918	189,983	6,861	7,246	204,090
1919	226,093	10,888	7,223	244,204
1920	277,093	16,205	8,012	301,310
1921	320,477	21,264	8,423	350,164
1922	361,060	26,788	5,917	393,765

A total of 2,135 dealers' licenses were also issued in 1922.

During 1922, 361,060 automobile licenses were issued, or one for every 7.2 inhabitants, while the average increase in automobile licenses issued during the past four years is 42,769 per year. This increase, if continued for five or six years, will place more than 600,000 automobiles on the streets and highways of Wisconsin.

Street railways may look forward to a continual increase in the number of automobile collision accidents unless some plan is developed which will impress every auto driver with the necessity of exercising care in approaching or driving on streets where street cars are operated.

The accompanying record of automobile-street car collisions in Wisconsin indicates the advisability of some form of educational program which will reach the auto drivers.

From a percentage standpoint the record is not unfavorable, as the automobiles increased 90 per cent and accidents 65 per cent. Analysis of our accident reports indicates that more than 90 per cent of these accidents are due to careless automobile operation, and that not to exceed 10 per cent of the accidents leave a question of responsibility. We may obtain some improvement in the debatable 10 per cent by careful supervision and instruction of trainmen, but the 90 per cent caused by the auto drivers presents a larger and more difficult problem.

In our study of the 1922 accidents at La Crosse, we took a system map and placed a red tack at the point where each accident occurred. This brought out the danger points on the system. We are keeping a similar map for 1923. These maps are installed in the trainmen's room, and we hope will assist them in the work of reducing accidents.

We found that 65 per cent of the accidents occurred on 10 per cent of our trackage located in the business district. Further study indicated that the majority of accidents were due to parking cars near the curb, and were caused by autos turning or backing onto the car tracks immediately in front of an approaching street car, or that the parked auto at the curb forced the moving autos in front of or into the sides of the street cars. Abolition of the parking privilege in the business districts on streets where street cars are operated will reduce materially this accident hazard. It also will speed up both street car and auto movements.

The suggestion is offered that our member companies use their influence toward abolishing the parking privilege on car line streets in their business districts, and that our association consider the advisability of arranging for the insertion of a safety bulletin in license plate envelopes to insure their receipt by every auto owner, or if this cannot be arranged, to secure addresses and mail a bulletin to each auto owner in the state.

*Abstract of paper presented before the Milwaukee convention of the Wisconsin Utilities Association, March 22-23, 1923.

ACCIDENT DATA—STATE OF WISCONSIN

(City Lines Only)

	1922	1921	1920	1919	1918
Car-miles operated	34,469,690	32,831,916	33,694,023	30,870,393	34,028,371
Passengers carried	246,809,978	248,288,805	264,333,189	246,578,129	222,187,616
Total transportation accidents	11,279	11,257	12,247	9,636	9,438
Auto collisions	5,780	5,522	5,662	3,997	3,497

Co-operation, Publicity and Service*

By James P. Barnes
President Louisville (Ky.) Railway

A SHORT time ago I made a few inquiries about the attitude of the public toward the utilities in the State of Wisconsin. In the answer which I received this phrase struck me particularly: "Some people in this state still have an idea that the average public utility men wear horns."

Now this phrase was written to me by a man whom I had never seen, who had never seen me and with whom this was my first correspondence. However, I understood what he meant because we use the same language, although accustomed to different colloquialisms. Reflection along this line brought me to realize, perhaps more clearly than usual, the fact that the good will of the public-utility business is, after all, founded on the element of understanding.

Public-utility men are sometimes too impatient with the straightforward, honest-intentioned business man who fails to understand their problem because they do not state it in his language. The public utility business has a highly specialized vocabulary. For example, we speak fluently of "return on investment," or "return on fair value of property," yet we refer infrequently to the fact that in our business the usual rate of gross earnings is from 15 per cent to 30 per cent annually of the amount invested in the property. The merchant or manufacturer usually turns over his capital from two to ten times annually. I have known a thoughtful man positively to gasp at the thought of an industry which requires from three to six years to turn over its capital, in some cases even longer. Such realization in most cases immediately enlists his sympathy with our problems and brings about co-operation.

This spirit of co-operation must permeate the investor and management,

*Abstract of address before meeting of Wisconsin Utilities Association, Milwaukee, Wis., March 22 and 23, 1923.

and in addition the employees and the customers of the property. Co-operation cannot be built on any basis other than that of mutual understanding of their common problems, and this understanding cannot be obtained without publicity. Publicity is a two-edged sword, but its use is essential and indispensable to the understanding and confidence upon which a successful public utility must be built. Like the legendary sword of King Arthur, publicity is a sharp, powerful and dangerous weapon, but it carries for its user a charm of protection if he but understands its spell. The formula for self-protection in its use can be expressed in one word: "Honesty." This will, in turn, bring justice.

The operator who will tell the truth about his business—its trials, difficulties, triumphs and successes—telling this story as news when it is news, as paid advertising when the purpose of the copy is advertising or propaganda, will find building up behind his property a public opinion based on confidence and sympathy of understanding, which will stand the test when the crisis comes.

Employees May Become Effective Publicity Agents

Publicity is of many kinds. Publicity through the newspapers, news stories and advertisement, is indispensable, but there is a subtler form of publicity disseminated through the contact of employees with the public, particularly in the street railway business, which is extremely powerful and often unappreciated. Employees are human beings and their impressions of the utility corporation, formed from their daily contacts with it, are often surprisingly accurate. These impressions will find frequent expression, consciously or unconsciously, in conversations with other people. Thus those with whom the employees talk will form opinions of your corporation and men, based very largely upon what your employees say and what they leave unsaid. We come back to the first rule of good citizenship, namely, that "our first duty is to put our own house in order." No detail is too small and no policy too large to be frankly discussed with and completely explained to any employee who has sufficient interest to inquire into it.

Summing up the whole proposition, it seems to me that success for the public utilities depends for the individual company on co-operation and publicity as to its affairs, both based on the sympathy of understanding arising from frank expression and discussion. Similarly, in a broader sense, the more the railways know of lighting and power problems and the more the telephone people know of railway problems, the closer we get together, the more intimately we discuss matters of policy, the better will be the investing, employee and public reaction to the public utility industry as a whole.

On the foundations of understanding, co-operation and publicity, with addition of courtesy, is built public service, our sole reason for being in business.

Too many men appear to conceive the sole function of management to be the payment of dividends. They forget that this obligation is but secondary, in the sense that dividends are only truly concerned when the public is served. The public service will stand as the goal of operation as we realize that today abide these three: co-operation, publicity, service, and the greatest of these is service.

American Association News

Power Distribution Engineers Meet in Chicago

A TWO-DAY meeting of the Engineering Association committee on power distribution was held in the Edison Building, Chicago, March 12 and 13. On March 12 six subcommittee meetings were held, three each morning and afternoon. The second day was taken up with a general meeting of the committee, at which the reports of subcommittees were considered. Those present were Messrs. M. B. Rosevear, chairman; J. W. Allen, R. L. Allen, L. W. Birch, H. G. Burd, L. E. Delf, D. D. Ewing, C. L. Hancock, C. J. Hixson, C. H. Jones, F. McVittie, W. Schaake, A. Schlesinger, J. Scott, F. J. White, C. R. Harte, sponsor, and A. Hughes, Jr., who acted as secretary.

Ralph H. Rice, Chicago Board of Supervising Engineers, and D. L. Smith, Metropolitan West Side Elevated Railway, also attended the meeting.

On the specifications for catenary construction other than for steam railroad electrification, Mr. Jones reported that the preliminary specification drawn up in 1921 is being carefully studied in sections by members of the subcommittee and that redrafts of all parts of the specification have been made and will be presented at the May meeting of the committee.

Mr. Murphy reported that progress is being made on the subject of trolley wire specifications, with a view to harmonizing the specifications of the association with those of the A.S.T.M., and ultimately to presenting a specification for adoption as "American standard" through the A.E.S.C. A questionnaire will be sent out to a selected list of railway companies to collect information regarding trolley breaks occurring from causes other than wear. Current-collecting devices will also be considered, and, if possible, a joint conference with the equipment committee will be held for the purpose of considering how best to deal with the current-collecting problem.

As to the Engineering Manual, the committee prepared a request to the executive committee to consider binding the Manual in three volumes, dealing respectively with roadway, equipment and electrical matters (power generation, power distribution and signals). It was thought that in this form the Manual would be more convenient than if bound in one volume.

Mr. McVittie stated that on the subject of trackless trolley the report will be confined to a historical summary of the development in this field, the description of each installation to be approved by the operating company before inclusion in the report.

The chairman announced that the association representatives on the technical committee which has been formed in connection with the revision of the crossing specification under the auspices of the A.E.S.C., will be as follows: On hazards, Mr. Harte; on clearances, Mr. McVittie; on definitions, Mr. Pharo; on underground construction, Mr. Rosevear. He also stated that the subjects of wood poles and tubular iron poles, which have been referred to the A.E.S.C., had been in turn referred to special committees, but no reports have as yet been received from these. Another subject referred to the A.E.S.C. was that of wires and cables, regarding which Mr. White, who is secretary of the sectional committee, reported that there were twelve technical committees handling this subject, some of which have been active and others inactive. Mr. McVittie stated that little progress has been made since the last report on the subject of lightning protection, which is also in the hands of the A.E.S.C.

There were some general discussions regarding conductivity of aluminum, on which a research committee and a policy committee have been appointed. It seemed to be the consensus of opinion that the standard for aluminum should be based upon copper, in spite of the fact that changes in conductivity, due to temperature variations, in the two metals are not parallel.

The committee also discussed inductive co-ordination and temporary connections to trolley wire for apparatus using heavy current, and reviewed certain of the power distribution specifications which are in the Manual.

The committee adjourned to meet in New York City on May 21 and 22.

Regulation of Motor Buses and Trucks

THE special committee of the American Association on motor buses and trucks, under the chairmanship of Philip H. Gadsden, met in New York City on March 28 with a good attendance of members of the committee and guests. Among those present were representatives of the United States Chamber of Commerce and the National Automobile Chamber of Commerce. A preliminary draft of a report, prepared by Harlow C. Clark, covering the whole subject of the committee's assignment in a general way was carefully reviewed. Plans were laid for the compilation of data regarding the electric railway industry which will show its magnitude and the nature of the service which it is rendering to the public.

Maintenance of Equipment

Steel Trolley Wire Replaced

New York, Westchester & Boston Has Changed Material of Contact Wire on Account of the Deposit of Rust on Cars—Porcelain Insulators Have Replaced Wood—Hangers Now Bolted

WHEN the New York, Westchester & Boston Railway was originally built in 1910, a departure from customary practice was made by using steel instead of copper for contact wire in the overhead construction. The low voltage d.c. power in general use on electric railways at that time necessitated copper trolley wire, but it was thought that with high voltage a.c. power, it would be feasible to use the cheaper material. Recently, however, this company has been replacing the old steel contact wire with phono-electric wire, and on new construction only the latter wire has been used.

The overhead system of this property is similar to that in use on the New York, New Haven & Hartford Railroad between Stamford and New Haven, on the Harlem River division of that road and elsewhere. Three wires in the same vertical plane are used over each track. From the topmost, or catenary, messenger are suspended by hangers a pair of parallel wires about 2 in. apart. The upper of the two parallel wires is the straight messenger, and the lower is the contact wire. All three wires are alive, and power is supplied at 11,000 volts at the anchor bridges about 9 miles apart.

Size No. 0000 grooved steel wire was used for the contact wire when the road was first built. No trouble has ever been experienced on account of the lower conductivity of steel as compared to copper. The freedom from this trouble may be due to the fact that the power demands have never closely approached 100 per cent of the line capacity. But it has been found that the steel wire rusts badly, especially in the groove. This defect was considered so serious that all replacements and extensions are now being made with No. 0000 phono-electric trolley wire. At present about 36 miles of the latter are in use, and only about 21 miles of the old steel wire remains on the upper end of the White Plains branch.

The use of steel contact wire produced a most undesirable result in another direction. The friction of the steel shoe of the pantograph against the steel of the contact wire caused a steel oxide dust of some sort resembling iron rust to be deposited on the roofs of the cars. There was not so much objection to the presence of the iron oxide on the roof, but when it rained, this substance was washed down onto the sides of the cars, quickly giving even a newly painted car a very drab appearance. No method of cleaning has been successful in removing this discoloration. A car fresh from the paint shop could hardly be distinguished at the end of a month's time from any other car on the road.

In the ELECTRIC RAILWAY JOURNAL of May 18, 1918, appeared a description of the way that special gutters along the roof had been applied to remedy the difficulty. But even this step did not wholly prevent the trouble. The use of phono-electric contact wire, however, has reduced to a marked degree the deposit of rust on the roofs of the cars. The original dark green color of the paint is preserved longer and it is expected that the trouble will be entirely eliminated as the use of alloy wire is extended.

PORCELAIN STRAIN INSULATORS SUBSTITUTED

Another change which is being made in the overhead construction of the New York, Westchester & Boston is in the type of span wire insulators. Wood strain insulators were used at first, but their maintenance has been so expensive that porcelain insulators are now replacing them at the rate of 300 to 400 a season. In damp weather there was considerable current leakage across the surface of the wood. This charred and burned the material until at length it was so weakened that it could no longer stand the strain. In order properly to maintain a wood insulator it was found necessary on this property to take it down at least once in two years, sandpaper the surface thoroughly and give it three coats of varnish. On the other hand, a porcelain insulator needs almost no further attention after being once installed, and is therefore more economical in the long run.

LOOSE HANGERS ELIMINATED

Some trouble has been experienced on the N. Y., W. & B. at times from loose trolley hangers. The vibration caused by the passing of the pantograph along the wire loosened the screws which held the hangers clamped to the wire. To obviate this trouble, the screws have now been replaced by bolts and lock washers. Since the change a loose hanger is an almost unknown thing on this road.

Weather Protection for Joint Plates Pays

THE Market Street Railway of San Francisco recently bought 1,200 pairs of joint plates in preparation for track reconstruction now contemplated and stored these plates in the material yard awaiting use.

Inexpensive Housing Over Storage Pile of 1,200 Joint Plates

As it will be at least several months before all of these will be required, a pile was made at a point convenient to a spur track and a light frame shed, with tar paper roof, was erected over the pile.

The shed was built at very little labor cost, with old lumber available in the yard, and will prevent the rust and scale that accumulates rapidly on new metal exposed to the weather.

Removing Grease and Dirt from Compressor Parts

A NUMBER of railways use hot lye for cleaning dirty and greasy metal parts, but its use in compressor overhauling is not generally practiced. The equipment, however, for carrying on this work is simple and easy to construct and the results obtained far outweigh the cost necessary.

The New York Consolidated Railway overhauls all its air compressors on a time schedule which brings them in about once every fifteen months. The compressors are entirely dismantled, and before any work is done toward replacement or repairs the parts are thoroughly cleaned. To do this all parts except gears, pistons, crankshafts and connection rods are placed in a tank containing a cleaning solution. Two tanks constructed of sheet iron are used for the cleaning work. They are the same size, being 41 in. x 32 in. x 31 in. high, set on a framework which brings the bottoms 9 in. above the floor and having angle iron corners to provide for stiffness and convenient riveting. A 2-in. x 2-in. angle iron is used at the bottom. The legs are also made of 2-in. x 2-in. angle iron and there are three on each side. A 1½-in. flat strip helps to steady the legs and form a more rigid support. One of these tanks is used for the hot cleaning solution, the other is a rinsing tank, in which cold water is used.

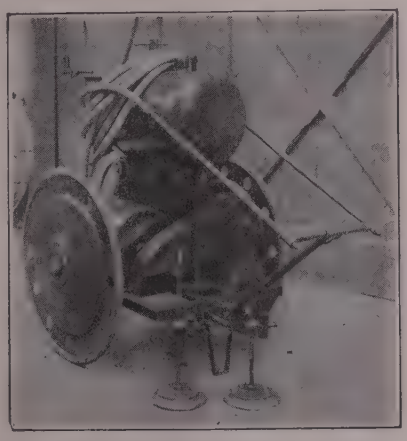
The tank containing the cleaning solution has a gas heating equipment which consists of three long burners installed underneath the tank. Also, in order to circulate the cleaning solution and provide for proper mixing, an air connection is led into the solution at one corner. Air is injected at an elbow near the bottom which has a plug with a large number of holes in it. Two sheet-iron covers with proper handles are used to cover the cleaning tank while the various parts are being cleaned. Ordinarily the parts are left in the solution about one-half hour. The large parts are handled by an overhead air crane and the small parts are placed in the solution by hand after ropes have been attached to them so that they can be conveniently removed. Small bolts, washers, nuts and the like are placed in an iron receptacle which is filled with holes so that the cleaning solution readily enters it. The cleaner used at present is furnished by J. C. Ford of Wyandotte, Mich., and 20 lb. of the cleaning powder is used to 100 gal. of water. About every other day 2 lb. of cleaning powder and 10 gal. of water are added.

After the various parts to be cleaned have been in the cleaning solution for a half hour they are removed and brushed briskly with a hand brush or a broom and are then placed in the rinsing tank. Large parts are raised and lowered in the rinsing water by means of the overhead hoist, and the smaller parts are moved around so as to give them a thorough rinsing. Cold water is continually flowing into and out of the rinsing tank, and an overflow is made with a 1-in. pipe connection and the opening into this has a screen. The tanks used will hold 130 gal. when filled up to the overflow pipe.

In order that the various parts may be kept together and assembled in the proper compressor each is numbered with red paint as it is removed from the rinsing tank.

Light-Weight, Double-Burner Preheater

THE Metal & Thermit Corporation has perfected a new light-weight double-burner rail preheater for thermit rail welding which is particularly designed to expedite work where the joints to be welded are scattered. The capacity of the blower and gasoline tank of the new double-burner preheater is double that of the single-burner preheater, and the new preheater is equipped with two heating coils instead of one, also with two 25-ft. lengths of hose.



Light-Weight Double-Burner Preheater

where the two burners can be used for preheating two joints simultaneously.

The new double-burner preheater has been thoroughly tested and has proved to be of as high efficiency as the single-burner preheater, which will continue to be supplied for use in cases where the double-burner preheater is not feasible, such as

Obtaining Best Results from Preheaters

THE Metal & Thermit Corporation, which has recently been conducting some extensive experiments with different types of burners to be used in connection with its standard thermit preheaters, found that the best results were secured with a burner pipe ⅜ in. in diameter, swaged down at one end and then drilled with a 5/16-in. hole. Such a burner pipe fully atomizes the fuel before it enters the mold and gives the best combustion. It was found that when larger burners were used, or when ends had not been swaged down, considerable air and fuel was wasted. The fuel does not become fully atomized, with the result that raw oil is carried into the mold or is wasted by dripping from the end of the pipe. A proper nozzle as described can be easily made.

Tin Superior to Solder for Fastening Wires

SOLDER has been replaced by tin in the shops of the Municipal Railway at San Francisco as a means for holding together the wires used in banding armatures. This change has been made to take advantage of the superior bonding quality developed by molten tin in contact with tinned steel and copper. Copper strips are placed around the armature as bands on which to wind the steel wires and the tin is applied with a soldering iron just as in the ordinary use of solder.

Keeping Down Oil Consumption

IN THE shops of the Eastern Massachusetts Street Railway at Fall River the local master mechanic, J. J. Curley, has his oilers divided into crews, each of which is supposed to do its work as if it were operating a small carhouse of its own. Each crew has its own packing can in the oil house with its own waste soaking and draining outfit. Each is allowed a certain amount of oil per month and is expected to get along within

this allowance. Each man is furnished with a 5-gal. can with a padlock so no one else uses his oil.

Smoothing Off Rebabbitted Bearings

THE old method of trimming up the edges of "windows" in rebabbitted bearings for the journal boxes of street cars has been discarded in the shops of the Municipal Railway at San Francisco in favor of the oxyacetylene torch. The torch flame is simply run around the edges of the windows, removing surplus metal and leaving a smooth edge.

Utilizing Out-of-Doors in Pipe Cutting

IN THE Fall River shops of the Eastern Massachusetts Street Railway a pipe vise is mounted on a bench close to an outside wall. A hole has been made in the wall and covered with a slide, to permit the end of a pipe to be threaded or cut without having the entire length of the pipe in the room, the pipe being pushed out through the hole to get rid of it. For use where quarters are close this plan appears to have merit and it certainly has proved to be convenient.

Closing Up Spread Armature Core Laminations

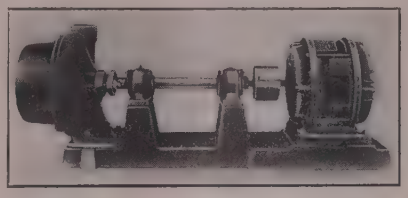
IN REPAIRING railway motor armatures, the laminations are sometimes found to be bent at the end of the armature core to such an extent that the coils used for rewinding will not fit. Also in the ventilated core type of armature the laminations become bent adjacent to the ventilating slots, sometimes to such an extent that the slots are entirely closed at the top. Where armatures are found in this condition it is quite necessary that the laminations be bent back into place. In doing this, if the laminations are struck on the end without some sort of support a little farther on, the bending is only transmitted to another part.

In order to take care of this condition, the New York & Queens County Railway has made some special tools which it uses in its Woodside shop armature room. To hold the laminations at the ventilating slot and also to bend these back in position a wedge-shaped tool with a slot in the wedge portion is used. This is driven into the ventilating core opening, the slotted part of the tool being of sufficient size to fit over the through portion of the slot. With the tools inserted in the ventilating core, the end laminations can be bent back without danger of shifting other laminations. A tool has been made which fits over the end bell of the armature and has a flat end to rest against the end lamination. This can be driven with a mallet without danger of its tipping up due to the blows, and thus the laminations can be bent back into position. Sometimes where laminations rub the pole faces badly they become distorted to as much as ½ inch.

New Equipment Available

New Ball-Bearing, Self-Priming Pump

THE Fulflo Specialties Company, Blanchester, Ohio, has added to its line of pumps the 75-gal., ball-bearing, motor-driven pump shown in the accompanying illustration. The



Motor-Driven, Impeller Pump of the "Fulflo" Type

manufacturers have given special attention to the self-priming and anti-clog features of these pumps and to their free-floating impellers. The construction is such that a steady flow of liquid is assured, whether the demand be small or great.

New Device Signals Rear Traffic

THE tremendous increase in automobile traffic has created new types of accidents in the form of damages to street cars from rear-end collisions and injuries to alighting passengers from automobiles failing to stop with the car.

An indicating stop signal system has been developed exclusively for street railway service, arranged so that with the first act of the motorman to stop the car by air-brake application, a signal light located on the rear dash signals the act to the rear traffic.

The signal is in the form of an inclosed electric lamp, one side of the box being fitted with a red cross-ribbed glass and the word "stop" ground into it, somewhat on the order of the popular stop lamp signal now used with such great success by motorists. The box is of such size that large distinct letters are used enabling the rear traffic to see the signal from considerable distance.

The signal control is tied in with the vestibule doors in such a manner that the signal lamp will remain lighted until all doors are fully closed and the air brakes released. This is accomplished by the use of door switches which make contact when the doors are opened.

The signal is controlled by application to the air brakes through a pneumatically operated switch arranged so that the switch contacts are closed with the first few pounds of air pressure applied to the brake system. The standard electric railway 23-watt lamp is used, eliminating the necessity of a new size in lamps.

On cars of the one-man safety type, where the doors are interlocked with the air brakes so that they cannot be opened until the brakes are applied, the door switches are not required.

This device is manufactured and sold by the Oskel Equipment Company, McCormick Building, Chicago.

Duplex Tape Saves Time

A COMBINATION tape, serving the purpose of both rubber and friction tapes, is now being made by the Diamond Holdfast Rubber Company. One side of the tape is a high-grade rubber compound, red in color, and the reverse side is fabric (friction tape) impregnated with adhesive and insulating mixtures. The friction side of the tape is black. Two advantages are claimed for this duplex tape: first, that the time saved by doing in one operation what is usually done in two, much more than counterbalances a higher initial cost; and second, that the presence of the two elements in one tape insures that any joint which is taped at all will be taped with both materials.

The News of the Industry

$25,000,000 Project Proposed

Plans for Subway System for Lines of Pacific Electric Railway in Los Angeles

The Los Angeles Planning Commission has just filed its plans with the Los Angeles Board of Public Utilities for a subway system for the cars of the Pacific Electric Railway that operate in congested streets. The railway company has favorably received the plans. The construction of the lines embraced in the project would represent an expenditure of $20,500,000. The proposed system of subways includes the provision of an underground terminal beneath the city's central park known as Pershing Square. The plans have also been approved by the Community Development Association of Los Angeles.

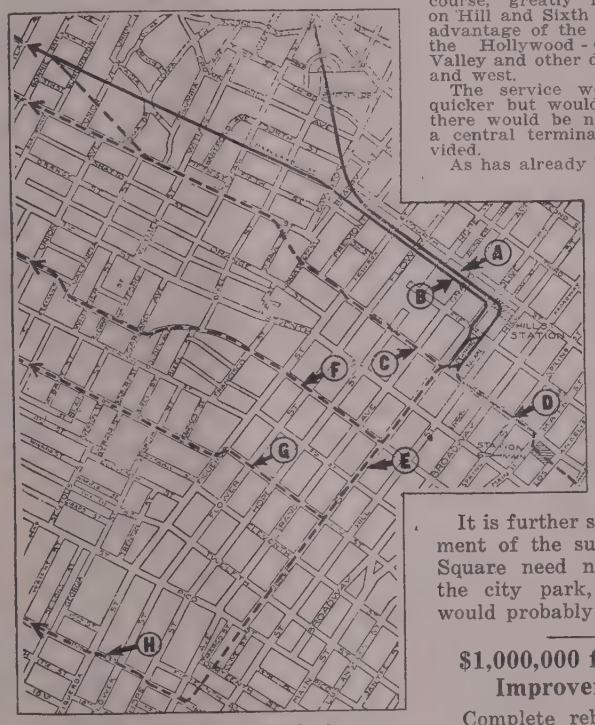
It is understood that the report of the City Board of Public Utilities to the City Council on transportation matters in Los Angeles will recommend that the Pacific Electric and the Los Angeles Railway lines be awarded the franchises asked by them to operate motor bus "feeder" lines to serve throughout the entire city; that the two railways arrange to establish a system of intercompany transfers, and that the Pacific Electric lines provide the necessary subway system whereby it would remove all of the interurban electric trains from the city's streets.

There will be no definite recommendation by the board, it is said, with respect to the application of the People's Motor Bus Company, which is fostered by the McAdoo interests, for franchise rights on 60 miles of the city's streets. The board's proposal in this matter is left to the decision of the people at the election on May 1. One of the initiative measures is designed to open up the congested district of the city to the operation of jitneys and motor buses. The other measure calls for a straw vote on the question whether the City Council shall advertise for sale a twenty-one-year franchise such as petitioned for by the People's Motorbus Company for the operation of a motorbus system in Los Angeles.

The huge system of subways has also been approved by the Los Angeles Traffic Commission.

The Pacific Electric Railway has plans already prepared for the construction, at a cost of $3,000,000, of its proposed Hollywood rapid transit subway, the terminal in Los Angeles being proposed at the company's present Hill Street terminal located between Fourth and Fifth Streets on Hill Street.

The City Planning Commission suggests that the present plan be abandoned of making the Pacific Electric Railway terminal on Hill Street between Fourth and Fifth Streets the terminal of the Hollywood subway, on which it was proposed to begin work shortly, and that, instead, Pershing Square, located on Hill Street between Fifth and Sixth Streets, be made the site of the terminal. The cost of the Hill Street-Hollywood subway project is estimated at $3,000,000, whereas the Pershing Square plan would cost $4,500,000 to carry out. Located four blocks east of Pershing Square is the present main interurban terminal of the Pacific Electric Railway at Sixth and Main Streets. The plan would be to connect this with the Pershing Square terminal.



Map of Downtown Transit Area

A—Glendale-Hollywood-San Fernando tunnel. B——Original P. E. Santa Monica Bay subway right of way. C—Possible extension along and under Sixth Street, west. D—Possible extension to P. E. Station at Sixth and Main Streets. E—Possible extension along and under Olive Street. F—Possible extension along and under Eighth Street. G—Possible extension along and under Tenth Street. H—Possible extension along and under Sixteenth Street. C, F, G and H are to serve western Los Angeles and Santa Monica Bay districts.

D. W. Pontius, vice-president and general manager of the Pacific Electric lines, in commenting on the plans of the City Planning Commission of Los Angeles, stated, in part:

> If instead the Hill Street surface terminal is used then it cannot subsequently be changed because of the difference in grades and in the end the subway system serving the city would be disconnected. There would be a further advantage in the location and the available space. Am informed that the city is in position to grant franchise for subway surface rights.

From the Pacific Electric viewpoint the serious problem is presented of expending probably $1,500,000 more, since subsurface terminals are expensive. The expenditure could be justified only in the hope that it might fit into the future plans, beneficial alike to the city and to the railway. It could not be justified on the basis of any increased volume of business in connection with the construction now authorized. We recognize fully though the force of the City Planning Commission's idea with respect to the future and for that reason will make effort at once to secure the necessary money if this project is officially approved.

The subways immediately to be built with the terminal under Pershing Square will, of course, greatly relieve traffic congestion on Hill and Sixth Streets, to the very great advantage of the city and to the people in the Hollywood - Glendale - San Fernando Valley and other districts lying to the north and west.

The service would not only be much quicker but would be made regular, since there would be no street interference and a central terminal location would be provided.

As has already been announced, the work on the subway with the old location of the terminal at Hill Street has been authorized and the right-of-way has been substantially all purchased and we are now ready to let contracts in accord with the agreement with the Railroad Commission, to furnish improved service to Hollywood, Glendale and other districts concerned. Therefore a prompt decision should be reached in connection with the City Planning Commission's project in order that relief may be had at the earliest possible moment.

It is further stated that the establishment of the subway beneath Pershing Square need not ruin the beauty of the city park, but on the contrary would probably improve it.

$1,000,000 for Extensions and Improvements in Toledo

Complete rebuilding of the railway system at Toledo is contemplated in the studies now being made. It will be recalled that under the Milner service-at-cost ordinance the Doherty interests are required to furnish $1,000,000 of new capital for extensions, crosstown line, and betterments within a period of two and one-half years from the granting of the ordinance. The time limit for the new work and new capital will be up July 1.

Commissioner Wilfred E. Cann has informed Council that his organization was busy mapping out some of the changes necessary to be made and in securing data for the use of engineers working on the problem.

E. O. Mills has begun the study of the railway for the purpose of arranging an ideal system to handle the business and traffic. His idea is to coordinate the railway system with the general zoning plan, development of railroad terminals, grade crossing eliminations, and other angles of the city plan. The crosstown line, which has been a demand for several years, will probably be worked out in this study.

Commissioner Cann had contemplated the use of motor buses on several of the extended lines or in crosstown service provided their operation on lines now authorized furnished data to insure their successful use.

A new loop for interurbans entering the downtown district would also give them access to the Interurban Station with only a small portion of their runs over existing lines used by city cars and with a much shorter distance to travel in the congested district. This plan has the approval of all sides and is awaiting financing to carry it out. Interurbans may be asked to help in the financing of the new track construction due to the fact that it will mean a large saving to them in trackage rentals annually. Within the loop is also contained the present interurban freight station.

Killed by Ridicule

A bill in the Missouri Legislature requiring the United Railways, St. Louis, to equip its cars with stoplights was fought by the receiver's attorneys until finally it was loaded down with absurd amendments and then killed by ridicule.

The bill as amended provided that the law should not be operative except during total eclipses of the sun and moon.

When Senator Kinney called up the bill Senator Irwin offered an amendment which provided that every driver of a street car should be required to keep a copy of Senate Bill 124 (the anti-bootlegging bill) conspicuously posted in each and every car while standing still and in operation.

Senator Kinney said the amendment did not appear to be germane, but it was adopted, only Kinney dissenting. This resulted in much merriment. When quiet was restored, Senator Painter sent up an amendment which provided that the conductor should have additional wire and when the car stopped he should go back 400 ft. and post a light that bore the word "stop." He should carry a pole on which a light should be posted.

"I am afraid that amendment will weaken this bill," said Senator Kinney, laughing. "I hope the Senate will defeat it." The amendment won unanimously.

"Another amendment, Mr. President," said Irwin. That amendment made the bill applicable to all vehicles and wheelbarrows when in operation on the public highways. That was adopted.

Senator Proctor then offered an amendment which provided that the law be only in effect during total eclipses of the sun and moon. "Now that the bill has been perfected," said Senator Kinney, "I move that it be put upon its final passage." "How about the title?" inquired Proctor. "The House can amend the title," said Kinney. It passed with only two dissenting votes.

The bill as originally drafted applied to St. Louis and Kansas City. It passed the House in that form. The Senate committee reported it favorably with an amendment making it applicable only to St. Louis. In the Senate it was laughed to death.

Railway Relieved from Paving Requirements

At a special municipal election held in Santa Cruz, Calif., on Feb. 28 to vote on a charter amendment that would relieve the Union Traction Company from the necessity of paving between the rails and for 2 ft. outside the tracks, the amendment carried by 143 votes; the total number of votes cast was 2,445.

There was no organized effort on the part of the proponents to carry the election, their activity being confined to sending out a circular prepared by a citizens' committee explaining the facts of the case. This circular was a four-page leaflet containing questions and answers. The situation was put very forcibly by four of these answers, which were as follows:

Q. It has been stated that the street-car company carries a certain amount of watered stock. Could not the dividends paid on this stock be used for street paving purposes?

A. There has never been a dividend paid on any of the stock of the Union Traction Company, watered or unwatered. None of this stock has any value and any person desiring to own it may secure title to it without cost.

Q. Would it not be possible to reduce the amount being paid as interest on borrowed money, thus securing means to pay for cost of street paving?

A. No interest has been paid by the company for six years and no money has been available for that purpose. As a result of this the bonds of the company can be bought at 10 cents on the dollar, or less.

Q. Why should the city not acquire the street car system and pay for street paving out of the earnings?

A. If the people desire to try this experiment the company stands ready to transfer the property to the city without charge.

Q. Is it possible to cut down street car expenses by reducing salaries of company officials?

A. Officials of the company receive no salaries whatever; neither is any charge made for office rent or clerical service. Investigation by a committee of citizens disclosed that only car men, shop men and track men are on the payroll.

$9,000,000 to Be Spent for Improvements

The officials and directors of the Terre Haute, Indianapolis & Eastern Traction Company of Indiana have approved plans calling for an expenditure of nearly $9,000,000. The program as outlined by Robert I. Todd, president, calls for the following:

Construction of super-power plant, $6,000,000.
Seven substations, estimated cost $750,000.
Power transmission lines, $1,000,000.
Company's part of freight interurban development, $333,000.
Total for Terre Haute, Indianapolis & Eastern, $8,083,000.
Indianapolis Street Railway, new rolling stock, $500,000.

Mr. Todd hopes to see most of the program put through this year. However, the outcome so far as the construction of the power station here depends on the suit filed in Indianapolis to determine the right of the Indiana Public Service Commission to issue an order of convenience permitting the company to enter this field with a new power plant. The order issued by the commission does not limit the T. H., I. & E. to supplying power for itself. It is being attacked by the Indianapolis Light, Heat & Power Company and the Merchants Heat & Light Company, which have plants at Indianapolis, Ind., and insist that they are able to take care of the city's needs of power.

In a statement which he made Mr. Todd said:

There are just two factors which are confronting us in our effort to solve present power transmission and street railway problems. They are, more power, and next, more equipment—rolling stock—and our entire development program scheduled for the present year revolves about those two. In order to remedy the power situation, we have plans and have made arrangements to construct a super-power plant at our West Tenth Street station, costing approximately $6,000,000.

More electric power is imperative for the solution of our railway traffic problem, and to that end, we have planned to erect six or seven substations at various points throughout the city. The next step will be the purchase of more rolling stock, and the year's plans call for the purchase of fifty new cars for the Indianapolis Street Railway.

However, much of this development work is contingent upon the litigation in the local court. We expect when that is out of the way to begin immediately upon the year's construction program. It is one of the most extensive developments ever attempted by the company. I, of course, would rather have said "we did" than "we are going to do," but I am telling you the scope of our plans for this year.

A special judge has been appointed to try the case immediately.

San Diego Employees Receive Pay Increase

An increase of pay to its platform men which will cost the San Diego (Calif.) Electric Railway about $40,000 a year more than the old schedule was announced by Claus Spreckels, general manager, at a meeting of the company's employees March 15. The new schedule became effective March 16 and will mean an increase of from 5 to 10 cents an hour for the men. The wage increase was a complete surprise to the men, and, along with other plans of the company, was announced by Manager Spreckels as a part of his aim to make San Diego's the "best street car system in the United States."

The new wage scale of the company ranges from 40 cents an hour for beginners to 55 cents an hour as top pay, with possible bonuses that bring the top pay to 65.5 cents, and 4 cents an hour is added all the way through for one-man car operators.

The new schedule of pay is as follows:

TWO-MAN CAR OPERATORS

	New Rate	New Rate with Estimated Bonus
First three months	40.0	50.5
Next three months	41.5	52.0
Next six months	43.0	53.5
Second year	45.0	55.5
Third year	46.0	56.5
Fourth year	47.0	57.5
Fifth to ninth year	48.0	58.5
Tenth to fourteenth year	49.0	59.5
Fifteenth to nineteenth year	50.0	60.5
Twentieth to twenty-fourth year	52.5	63.0
Twenty-fifth year and after	55.0	65.5

Estimated amounts included in the bonus:

Ticket commissions	$3.50
Accident fund	3.00
Monthly bonus	2.00
Welfare service	2.00
Total	$10.50

Columbus Award Sustained, but Reduced Slightly

The Court of Appeals of Ohio in the case of the Columbus Railway, Power & Light Company, Columbus, Ohio, against E. W. Clark & Company and the individual members of that company has rendered a judgment for $799,017, which with interest of $337,292 computed to April 1 makes a total amount of $1,136,310. This is a smaller amount than was awarded by the lower court mainly due to the fact that the management contract was not made until the year 1912. Under the decision of the Court of Common Pleas the principal award was $1,079,726 with interest of $432,294 to April 1, making $1,512,021 as against the Court of Appeal's principal, including interest, $1,136,310, or a net difference of $375,711.

On Jan. 21, 1922, Judge Kinkead of the Franklin County Common Pleas Court rendered a judgment of $1,079,726 in favor of the local Columbus Company against E. W. Clark & Company, former operating managers at Columbus, in the so-called Slaymaker suit. A list of the items in the judgment was published in the ELECTRIC RAILWAY JOURNAL for Jan. 28, page 168.

Arbitration to Be Discussed in New York

The week of May 7-12 will be "Arbitration Educational Week." In that seven-day period commercial associations and trade organizations in New York City and State will unite in an intensive effort to make known to all citizens the benefits to be derived by making use of arbitration in the settlement of business differences and disputes.

An endeavor will be put forth in this week of may to let people know that within their reach there is a simple and direct, a prompt and inexpensive way of deciding controversies and of avoiding the costly, harassing and tedious processes of litigation.

The announcement of this "educational drive for arbitration" was made at a dinner given by the Arbitration Society of America to some 400 representatives of trades, industries and commercial and professional organizations at the Hotel Pennsylvania, New York City, the evening of March 14.

All who are interested in the movement for the week's educational course in arbitration are requested to communicate with temporary headquarters of the committee which have been established in Room 906, 115 Broadway, where information as to the plan for "Arbitration Educational Week" will be gladly given.

New Plant Ready in August

The City Light & Traction Company's new plant at Sedalia, Mo., in course of erection by the Henry L. Doherty interests of New York City, will probably be ready for operation by August. The plant will have a capacity of 8,000 kw. It will cost about $350,000 fully equipped. It is the aim of the company to have the plant finished in time for the annual Missouri State Fair in August. A combination of coal and oil settings is being installed so that either fuel can be used. The smokestack will have a diameter of 20 ft., setting on a block of concrete, which will be 40 ft. in diameter and 9 ft. deep.

Passage of Bill Permits Railway to Enter Cincinnati

The first step toward the entrance of the Cincinnati, Lawrenceburg & Aurora Electric Street Railroad into the heart of the Cincinnati business district on an elevated structure was taken on March 9, when the House of Representatives at Columbus, unanimously passed the bill of Representative Samuel Lipp of Cincinnati carrying the necessary legislation. The bill repeals an old law which limited the fare to be charged on elevated railways within city limits to 5 cents and substitutes a provision that the rate of fare shall be agreed upon between the City Council and the interurban company. The proposed elevated structure will extend the interurban line from its present terminus at Anderson's Ferry to the Dixie Terminal.

Arrangements were completed more than a year ago to extend the interurban road so as to bring its cars into the Dixie Terminal on elevated tracks from Sixth Street and State Avenue. When it was found that the Schmidlapp law provided that only a 5-cent fare could be charged the project was abandoned for the time being because it could not be financed on that basis. The Cincinnati, Lawrenceburg & Aurora Electric Street Railroad will use the right-of-way of the Big Four Railroad from Anderson's Ferry to Sixth Street and State Avenue. The railroad has agreed to lease part of its property to the interurban company for that purpose. The extension would cost $750,000.

Looks to Electrification.—P. H. Nee, superintendent of the Wisconsin Valley division of the Chicago, Milwaukee & St. Paul Railway, stated in Merrill recently that he looked forward to the eventual electrification of the Wisconsin Valley system of the road with overhead lines.

Reports No Accidents.—The City Light & Traction Company at Sedalia, Mo., on March 16, announced that not a single accident had been reported since Jan. 1. This is declared to have been the longest period of time ever passed that some employee of the traction had not incurred a personal injury of some sort.

Seeks Restoration of Service.—Assemblyman Dunne has introduced a bill in the New York State Legislature directing the Brooklyn Heights (N. Y.) Railroad, or such person as may be in control of the same, to restore service on the Tompkins-Culver line, in the Borough of Brooklyn, State of New York, for a fare not exceeding 5 cents.

Classes for Supervisors Formed.—Regular classes for supervisors have been started by the Los Angeles (Calif.) Railway, to keep them informed on recent matters affecting transportation. The meetings are held every Friday in the instruction department lecture room. Subjects are announced for one week ahead and certain supervisors are instructed to prepare to lead the discussion.

Opposed to Germantown Branch.—In a report to the City Council Transit Director Twining of Philadelphia, Pa., opposed the construction of a high-speed branch of the Broad Street subway to Germantown and Chestnut Hill. He said he believed that the proposed electrification of the Philadelphia & Reading Railway branch to Germantown would take care of the transportation needs of that section.

Commission Requires Data Filed.—In line with its policy of keeping a close account of the affairs of all public utilities corporations in order that the public interest may be thoroughly safeguarded, the California Railroad Commission recently adopted a resolution requiring public utilities to file salary data and an accounting of donations, contributions, subscriptions and cash balances.

Employees Have Chance to Win Money.—The British Columbia Electric Railway, Vancouver, B. C., will offer a prize of $5 each month to the best article on the prevention of street car accidents. The contest is open to any employee not on the office payrolls. According to the rules of the contest articles must be turned in on or before the twentieth of the month and should not be more than 500 words long.

Re-Elect Employees Representative.—Employees of the Louisville (Ky.) Railway, were so well pleased with the work of Daniel L. Kehl, representative of the Welfare Association of Employees on the board of directors of the company, that they re-elected him as employees' representative at the annual election on Feb. 15. Mr. Kehl is a clerk in the maintenance of way department. The practice of having an employee on the board was started in 1922, and has become a part of the regular method of handling the affairs of the company.

J. N. Clark Heads Pacific Railway Club.—The Pacific Railway Club, at its meeting in Berkeley, Calif., on March 8, listened to an address by George M. Basford, consulting engineer, Lima Locomotive Works, Inc., on the subject "As to the Locomotive, What Next?" New officers for the year were elected as follows: President, J. N. Clark, chief fuel supervisor Southern Pacific Company; first vice-president, J. M. Yount, master mechanic Market Street Railway; second vice-president, H. A. Mitchell, vice-president and general manager San Francisco-Sacramento Railroad; treasurer, R. G. Harmon, chief clerk city freight department, Western Pacific Railroad.

Financial and Corporate

$15,103 Behind Return

Grand Rapids Year Better, but Company Ran Behind Return Allowed Under New Grant

For the first time in several years the Grand Rapids (Mich.) Railway in 1922 earned a small surplus over charges. This surplus was only $6,583, but it compares with a deficit of $30,481 in 1921, and a deficit of $147,070 in 1920. Since 1920 the ratio of operating expenses to gross earnings has been gradually reduced from 74.17 per cent in 1920 to 66.33 per cent in 1921, and to 65.29 per cent in 1922. Likewise the ratio of operating expenses and taxes to gross earnings has been decreased from 81.27 per cent in 1920 to 73.51 per cent in 1921 and then to 72.41 per cent in 1922.

It will be recalled that a new franchise was passed by the City Commission of Grand Rapids on June 12, 1922, and was accepted by the company subject to the approval of the electors of the city. At an election held Sept. 12 the franchise was submitted to the people and approved by approximately 72 per cent of the voters. The franchise was immediately put into effect. It is of the service-at-cost type, based on an initial valuation of the property for rate making purposes of $5,500,000, plus the cost of additions made from time to time, the rate of return depending upon the rate of fare charged. The initial rate of return was fixed at 8 per cent with the same fare as was in effect during the greater part of 1922, namely, 10 cents cash or seven tickets for 50 cents, transfers free.

L. J. DeLamarter, vice-president and general manager of the company, explained in the report of the company that from Sept. 1, 1922, the date as of which the franchise became effective, to Dec. 1, 1922, the company failed by the amount of $15,103 to earn the return to which it was entitled. He says that more favorable results are expected in 1923, however, as the management hopes to effect further operating economies without any curtailment of the service rendered to the public.

Capital expenditures during the year were devoted principally to the betterment of the company's existing facilities. They amounted to $207,840. Against this sum there was a credit of $102,136 representing the cost of property retired from service, making the net addition $105,704. Seventeen cars were remodeled into equipment of more modern type and fitted with standard safety car devices, so that they may be operated as one-man cars. It is planned to remodel twenty-eight more cars in a similar manner during 1923 and to purchase eight new cars of this type. It is also proposed, according to Mr. DeLamarter, to purchase six modern motor buses to provide service in some parts of the city not now supplied with railway facilities and for use in other sections when the streets are placed in good condition.

SERVICE RENDERED

Total number of passengers carried annually by the Grand Rapids Railway for the past five years:

	Revenue Passengers	Transfer Passengers	Total Passengers
1922	24,058,780	6,191,023	30,249,803
1921	24,437,134	6,250,583	30,687,717
1920	27,813,220	6,627,889	34,441,109
1919	26,307,032	6,474,666	32,781,698
1918	24,884,739	5,990,443	30,875,182

Mr. DeLamarter reports that business conditions in Grand Rapids showed further improvement during 1922 and that a recent survey of the industrial situation indicates that the various local manufacturers will operate their plants at capacity throughout 1923. He says that there is every indication that Grand Rapids will enjoy a continuation of progress and prosperity during the coming year and that the effect of this increased activity should be reflected in the company's operating results for the coming year.

Statement of earnings of the Grand Rapids Railway for the year ended Dec. 31, 1922, together with comparative statement of income and expenses for the two preceding years.

	1922	1921	1920
Gross earnings:			
Passenger revenue—city lines	$1,813,246	$1,795,634	$1,740,952
Revenue from special cars, etc.	1,171	1,092	3,992
Rent of equipment, tracks, etc.	43,223	47,584	57,987
Non-operating revenue	3,836	421	1,362
Total	$1,861,476	$1,844,731	$1,804,293
Operating expenses, taxes and depreciation:			
Operating expenses	$1,215,522	$1,223,779	$1,338,312
Taxes	132,403	132,244	128,052
Depreciation	176,131	181,323	150,000
Total	$1,524,056	$1,537,346	$1,616,364
Gross income	$337,420	$307,385	187,928
Interest and other fixed charges	330,836	337,867	334,998
Net income	$6,584	$*30,484	$*147,070
* Deficit			
Ratio of operating expenses to gross earnings	65.29%	66.33%	74.17%
Ratio of operating expenses and taxes to gross earnings	72.41%	73.51%	81.27%

I.T.S. Stockholders Approved Merger Plan

At an adjourned meeting of the stockholders of the Illinois Traction Company, Peoria, Ill., held in Portland, Me., the plan was approved for consolidating the Southern Illinois properties controlled by Clement Studebaker, Jr., and his associates, with those of the Illinois Traction Company. The plan will be carried out in accordance with terms outlined in the ELECTRIC RAILWAY JOURNAL for March 10, page 424.

New Directors Elected

At the annual meeting of the stockholders of the Philadelphia (Pa.) Rapid Transit Company held on March 21 a resolution was passed providing that a co-operative wage dividend of 10 per cent of the annual wage for 1923 be paid employees after the payment of the usual 6 per cent dividend had been made to stockholders.

Three new members were elected to the board of directors. They are Leon Jewell, vice-president in charge of traffic; W. K. Myers, acting vice-president, and R. R. Nyman, who, as president of the Co-operative Welfare Association, represents the employees.

The first two men replace Nelson Robinson and H. G. Tulley. Mr. Nyman, who is a motorman on the Lombard and South Streets line, replaces John E. McElroy, a foreman, who is the past-president of the Co-operative Association.

Other changes in organization were referred to in the ELECTRIC RAILWAY JOURNAL, issue of Feb. 24.

Net Income Up 63 per Cent

Summary Presented of Reports of 225 Companies—Outlook for Industry Very Promising

Edmund J. Murphy, chief statistician of the American Electric Railway Association, writing in A.E.R.A. for April, 1923, says that reports from electric railways for the year 1922 show that at the present time the electric railways are in a stronger position financially than they have been at any time since 1917. The operating ratio is down to 72.6 per cent and the net income after the payment of all expenses, taxes and fixed charges has increased more than 60 per cent over the figure for 1921. The 1921 net was 186 per cent greater than that of 1920. In 1922, the interurban lines came back strongly.

The summary of the trend of railway operations in 1922 is based on reports of 225 companies. Their combined figures are shown in the accompanying tables together with certain traffic ratios calculated from the figures on a comparable basis. The 225 companies operate 21,484 miles of single track, of which 13,679 miles are city track and 7,805 miles interurban track. The city track is about half the total in the country and the interurban track about 43 per cent of all interurban track. The combined railway revenues of these companies amount to about one-half of the total railway earnings of the industry.

The tables show that the net income of these companies increased from $22,852,418 in 1921 to $37,237,680 in 1922, or 63 per cent. The operating ratio of the combined groups dropped from 75.54 per cent to 72.66 per cent.

TABLE I—COMBINED INCOME STATEMENT OF 225 URBAN AND INTERURBAN RAILWAYS FOR 1922 COMPARED WITH 1921

	1922	1921	Increase	Per Cent Increase
Railway operating revenue..	$464,365,210	$469,548,024	*$5,182,814*	*1.10*
Railway operating expenses.	337,419,485	354,738,718	*17,319,233*	*4.88*
Net operating revenue....	$126,945,725	$114,809,306	12,136,419	10.57
Net revenue auxiliary operations	20,709,359	18,631,987	2,077,372	11.14
Taxes	33,622,064	32,347,991	1,274,073	3.94
Operating income	$114,033,020	$101,093,302	12,939,718	12.80
Non-operating income	9,203,921	8,444,185	759,736	9.00
Gross income	$123,236,941	$109,537,487	13,699,454	12.51
Income deductions	85,999,261	86,685,069	*685,808*	*0.79*
Net income	$37,237,680	$22,852,418	14,385,262	62.95
Operating ratio (per cent)...	72.66	75.54	*2.88*	*3.81*
Ratio: net income to operating revenue (per cent)..	8.02	4.87	3.15	64.68

Note—*Italics* denote decrease.

TABLE II—COMBINED INCOME STATEMENT OF 121 URBAN RAILWAYS FOR YEAR 1922 COMPARED WITH 1921

	1922	1921	Increase	Per Cent Increase
Railway operating revenue..	$387,244,748	$390,739,415	*$3,494,667*	*0.90*
Railway operating expenses.	277,774,741	291,631,472	*13,856,731*	*4.75*
Net operating revenue....	$109,470,007	$99,107,943	10,362,064	10.45
Net revenue auxiliary operations	14,203,448	12,770,636	1,432,812	11.22
Taxes	28,528,551	27,403,521	1,125,030	4.10
Operating income	$95,144,904	$84,475,058	10,669,846	12.63
Non-operating income	6,606,859	5,842,356	764,503	13.08
Gross income	$101,751,763	$90,317,414	11,434,349	12.66
Income reductions	69,025,224	69,390,202	*364,978*	*0.53*
Net income	$32,726,539	$20,927,212	11,799,327	56.38
Operating ratio (per cent)...	71.73	74.63	*2.90*	*3.89*
Ratio: net income to operating revenue (per cent)....	8.45	5.36	3.09	57.64

Note—*Italics* denote decrease.

TABLE III—COMBINED INCOME STATEMENT OF 104 INTERURBAN RAILWAYS FOR 1922 COMPARED WITH 1921

	1922	1921	Increase	Per Cent Increase
Railway operating revenue..	$77,120,462	$78,808,609	*$1,688,147*	*2.15*
Railway operating expenses.	59,644,744	63,107,246	*3,462,502*	*5.49*
Net operating revenue....	$17,475,718	$15,701,363	1,774,355	11.30
Net revenue auxiliary operations	6,505,911	5,861,351	644,560	11.00
Taxes	5,093,513	4,944,470	149,043	3.01
Operating income	$18,888,116	$16,618,244	2,269,872	13.66
Non-operating income	2,597,062	2,601,829	*4,767*	*0.18*
Gross income	$21,485,178	$19,220,073	2,265,105	11.78
Income deductions	16,974,037	17,294,867	*320,830*	*1.86*
Net income	$4,511,141	$1,925,206	2,585,935	134.32
Operating ratio (per cent)...	77.34	80.08	*2.74*	*3.43*
Ratio: net income to operating revenue (per cent)....	5.85	2.44	3.41	139.75

Note—*Italics* denote decrease.

TABLE IV—COMBINED STATEMENT OF OPERATING EXPENSES OF 225 URBAN AND INTERURBAN RAILWAYS FOR 1922 COMPARED WITH 1921

	1922	1921	Increase	Per Cent Increase
Way and structure	$48,888,542	$50,492,228	*$1,603,686*	*3.18*
Equipment	40,668,430	44,836,816	*4,168,386*	*9.30*
Power	51,574,563	52,161,245	*586,682*	*1.13*
Conducting transportation..	143,220,630	153,981,163	*10,760,533*	*6.99*
Traffic	1,131,400	1,009,636	121,764	12.06
General and miscellaneous..	46,269,268	46,580,538	*311,270*	*0.67*
Transportation for investment credit	*178,132*	*76,256*	101,876	133.60
Total operating expenses	*$337,419,485	†$354,737,813	*$17,318,328*	*4.88*

* Includes $5,844,784 miscellaneous expense and undistributed depreciation.
† Includes $5,752,443 miscellaneous expense and undistributed depreciation.
Note—*Italics* denote decrease.

TABLE V—COMBINED INCOME STATEMENT ON A CAR-MILE BASIS (IN CENTS) OF 121 URBAN, 104 INTERURBAN AND THE COMBINED TOTAL OF 225 URBAN AND INTERURBAN RAILWAYS FOR 1922 COMPARED WITH 1921

	121 Urban Railways			104 Interurban Railways			225 Urban & Interurban Railways		
	1922	1921	Per Cent Increase	1922	1921	Per Cent Increase	1922	1921	Per Cent Increase
Railway operating revenue	45.7	46.1	*0.9*	45.1	47.2	*4.5*	45.5	46.6	*2.4*
Railway operating expenses	32.8	34.4	*4.7*	34.9	37.8	*7.7*	33.0	35.2	*6.3*
Net operating revenue	12.9	11.7	10.3	10.2	9.4	8.5	12.5	11.4	9.7
Net revenue auxiliary operations	1.7	1.5	13.3	3.8	3.5	8.6	2.0	1.8	11.1
Taxes	3.4	3.2	6.3	3.0	3.0	....	3.3	3.2	3.1
Operating income	11.2	10.0	12.0	11.0	9.9	11.1	11.2	10.0	12.0
Non-operating income	0.8	0.7	14.3	1.5	1.6	*6.3*	0.9	0.8	12.5
Gross income	12.0	10.7	12.2	12.5	11.5	8.7	12.1	10.8	12.0
Income deductions	8.2	8.2	....	9.9	10.3	*3.9*	8.4	8.6	*2.3*
Net income	3.8	2.5	52.0	2.6	1.2	*116.7*	3.7	2.2	68.2

Note—*Italics* denote decrease.

TABLE VI—COMBINED STATEMENT OF OPERATING EXPENSES OF 121 URBAN RAILWAYS FOR 1922 COMPARED WITH 1921

	1922	1921	Increase	Per Cent Increase
Way and structures	$38,538,528	$39,478,562	*$940,034*	*2.38*
Equipment	33,681,548	37,081,258	*3,399,710*	*9.17*
Power	40,769,134	41,089,374	*320,240*	*0.78*
Conducting transportation..	122,005,545	131,017,097	*9,011,552*	*6.88*
Traffic	636,656	531,214	105,442	19.85
General and miscellaneous..	36,560,251	36,857,759	*297,508*	*0.81*
Transportation for investment credit	*132,880*	*48,230*	84,650	175.51
Total operating expenses	*$277,774,741	†$291,631,472	*$13,856,731*	*4.75*

* Includes $5,715,959 miscellaneous expense and undistributed depreciation.
† Includes $5,624,438 miscellaneous expense and undistributed depreciation.
Note—*Italics* denote decrease.

TABLE VII—COMBINED STATEMENT OF OPERATING EXPENSES OF 104 INTERURBAN RAILWAYS FOR 1922 COMPARED WITH 1921

	1922	1921	Increase	Per Cent Increase
Way and structures	$10,350,014	$11,013,666	*$663,652*	*6.03*
Equipment	6,986,882	7,755,558	*768,676*	*9.92*
Power	10,805,429	11,071,871	*266,442*	*2.41*
Conducting transportation..	21,215,085	22,964,066	*1,748,981*	*7.62*
Traffic	494,744	478,422	16,322	3.41
General and miscellaneous..	9,709,017	9,722,779	*13,762*	*0.15*
Transportation for investment credit	*45,252*	*28,026*	17,226	61.40
Total operating expenses..	*$59,644,744	†$63,106,341	*3,461,597*	*5.49*

* Includes $128,825 miscellaneous expense and undistributed depreciation.
† Includes $128,005 miscellaneous expense and undistributed depreciation.
Note—*Italics* denote decrease.

TABLE VIII—COMBINED STATEMENT OF OPERATING EXPENSES ON A CAR-MILE BASIS (IN CENTS) OF 121 URBAN, 104 INTERURBAN AND A COMBINED TOTAL OF 225 URBAN AND INTERURBAN ELECTRIC RAILWAYS FOR THE CALENDAR YEAR 1922 COMPARED WITH THE CALENDAR YEAR 1921

	121 Urban Railways			104 Interurban Railways			225 Urban & Interurban Railways		
	1922	1921	Per Cent Increase	1922	1921	Per Cent Increase	1922	1921	Per Cent Increase
Way and structures	4.6	4.6	....	6.0	6.6	*9.0*	4.9	5.0	*2.0*
Equipment	4.0	4.4	*9.0*	4.1	4.7	*12.8*	3.9	4.4	*11.4*
Power	4.8	4.8	....	6.3	6.6	*4.5*	5.0	5.2	*3.9*
Conducting transportation	14.3	15.4	*7.1*	12.4	13.7	*9.5*	14.0	15.3	*8.5*
Traffic	0.08	0.06	33.3	0.3	0.3	....	0.1	0.1	....
General and miscellaneous	4.3	4.4	*2.3*	5.7	5.8	*1.7*	4.5	4.6	*2.2*
Transportation for investment credit	*0.02*	*0.006*	233.3	0.3	0.02	50.0	0.02	0.008	150.0
Total operating expenses	*32.8	†34.4	*4.7*	(*a*)34.9	(*b*)37.8	*7.7*	(*c*)33.0	(*d*)35.2	*6.3*

Note—*Italics* denote decrease.
* Includes 0.7 cent miscellaneous expense and undistributed depreciation.
† Includes 0.7 cent miscellaneous expense and undistributed depreciation.
(*a*) Includes 0.08 cent miscellaneous expense and undistributed depreciation.
(*b*) Includes 0.08 cent miscellaneous expense and undistributed depreciation.
(*c*) Includes 0.6 cent miscellaneous expense and undistributed depreciation.
(*d*) Includes 0.6 cent miscellaneous expense and undistributed depreciation.

TABLE IX—COMBINED STATEMENT OF TRAFFIC STATISTICS OF 121 URBAN, 104 INTERURBAN AND THE COMBINED TOTAL OF 225 URBAN AND INTERURBAN RAILWAYS FOR YEAR 1922 COMPARED WITH 1921

	121 Urban Railways			104 Interurban Railways			225 Interurban and Urban Railways		
	1922	1921	Per Cent Increase	1922	1921	Per Cent Increase	1922	1921	Per Cent Increase
Car-miles (revenue)	$845,734,745	$847,592,698	*0.22*	$171,178,091	$166,655,977	2.71	$1,016,912,836	$1,014,248,675	0.3
Car-hours (revenue) (*a*)	$87,859,148	$88,183,278	*0.37*	$12,312,871	$11,975,022	2.82	$100,172,019	$100,158,300	0.013
Total passengers (*b*)	7,141,465,488	7,115,513,825	0.36	664,830,692	662,025,859	0.42	7,806,296,180	7,777,539,684	0.37
Revenue passengers (*c*)	5,594,228,682	5,589,527,249	0.08	582,097,091	583,373,097	*0.22*	6,176,325,773	6,172,900,346	0.05
Transfer passengers	1,484,724,216	1,456,458,387	1.94	76,311,362	71,800,780	6.28	1,561,035,578	1,528,259,167	2.14
Miles of single track	13,678.9	13,667.8	0.08	7,804.7	7,697.6	1.39	21,483.6	21,365.4	0.55
Cars operated (*e*)	20,841	20,381	2.26	1,301	1,286	1.16	22,142	21,667	2.65
Passenger revenue	$377,438,473	$379,870,548	*0.64*	$64,278,476	$64,490,371	*0.33*	$441,716,949	$444,360,919	*0.59*

Note—Italics denote decrease.
(*a*) Car-hours were reported by one hundred and eighteen urban companies and eighty-two interurban companies, making a total of two hundred companies.
(*b*) Two interurban companies did not report total passengers carried.
(*c*) Two interurban companies did not report revenue passengers carried.
(*e*) Cars operated were reported by one hundred and four urban companies and seventy-four interurban companies, making a total of one hundred and seventy-eight companies.

These are the outstanding features of the year's returns. The increase in the net income amounted in actual money to $14,385,262, a most hopeful sign.

The number of passengers carried in 1922 was greater by nearly 30,000,000 than in 1921. The first half of the year the electric railways sustained heavy losses. The second half of the year found the trend in the other direction and each succeeding month showed an increased gain in the number of passengers carried. These gains more than offset the earlier losses so that the year as a whole registered a slight improvement over 1921. Thus, the actual conditions are more favorable than these figures would seem to indicate.

Although the number of passengers carried increased slightly as set forth above the receipts from railway operations fell off slightly more than 1 per cent. This was brought about by reductions in fares in 1922. For the most part these fare reductions took the form of lower rates for the frequent rider who purchases reduced rate tickets. For the whole group of 225 companies the average fare per passenger dropped from 7.2 cents in 1921 to 7.1 cents in 1922. For the city lines alone, it fell from 6.8 cents to 6.7 cents and for the interurbans it remained constant at 11 cents. As Mr. Murphy sees it this indicates very clearly that the industry is not yet in a position where it can afford to reduce its fares. Under present conditions a very small reduction in fares is immediately reflected in lower revenues.

The total operating expenses for the whole group fell from $354,738,718 in 1921 to $337,419,485 in 1922, a decrease of $17,319,233, or 4.88 per cent. The city lines showed a decrease of 4.75 per cent and the interurban 5.49 per cent. This, of course, is the main reason for the improved condition of the electric railways. Conducting transportation, which is made up principally of trainmen's wages, decreased 7 per cent, representing a saving of $10,760,533.

Mr. Murphy says it would seem that the industry will have to look to increased traffic to further improve its position in 1923 rather than to a continued decline in the cost of operation.

Earnings Statement Presented at Buffalo Meeting

Thomas E. Mitten was re-elected chairman of the board of directors of the International Railway, Buffalo, at the annual meeting of stockholders. The entire capital stock of the company, consisting of 167,075 shares, was voted supporting the work of Mitten Management, Inc., during the strike of 1922 and for its continuance in conformity with its contract covering the operation of the local and interurban lines of the International.

Coleman J. Joyce, was re-elected vice-chairman and counsel. Other officers elected were: Herbert G. Tulley, president; Thomas Penney, general counsel; R. Harland Horton, vice-president in charge of traffic; H. L. Mack, vice-president in charge of engineering; F. T. Nelson, comptroller; C. A. Webber, secretary-treasurer and C. A. Chavel, auditor. Those on the executive committee are Messrs. Mitten, Joyce and Tulley.

The following directors were elected: Thomas E. Mitten, Dr. Henry C. Buswell, John J. Clawson, Walter P. Cooke, W. C. Dunbar, Coleman J. Joyce, R. Harland Horton, Charles R. Huntley, H. L. Mack, Thomas Penney, Harry T. Ramsdell, Nelson Robinson, Carlton M. Smith, Herbert G. Tulley, C. A. Weber, Harry Yates and Henry C. Zeller.

Passenger revenue for the six months ended Dec. 31, 1922, was $1,995,733 and for the year ended June 30, 1922, was $10,248,361. The cost of conducting transportation in the last six months of the year (during the period of the strike) was nearly two-thirds as much as for the previous full year.

Conducting transportation cost $2,085,433 in the six strike months, as compared with $3,440,020 in the previous full year. Gross operating income for the full year ending June 30, 1922, was $1,596,604 as compared with an operating deficit of $3,396,226 in the six months beginning with July 1, 1922, the day the strike started. After payment of all charges, including interest, rentals, taxes, etc., the company had a net income of $284,893 in the full year ending with June 30, 1922, but the six months' operation during the strike resulted in a net deficit of $4,107,514. The balance sheets lists this "unamortized strike suspense" of $4,107,514 as an asset. Other items are $44,000,-

TABLE X—SOME SIGNIFICANT RATIOS DERIVED FROM THE FIGURES SHOWN IN TABLES I TO IX.

	121 Urban Railways			104 Interurban Railways			225 Urban and Interurban Railways		
	1922	1921	Per Cent Increase	1922	1921	Per Cent Increase	1922	1921	Per Cent Increase
Railway operating revenue	$387,244,748	$390,739,415	*0.90*	$77,120,462	$78,808,609	*2.15*	$464,365,210	$469,548,024	*1.10*
Per mile of single track	28,310	28,588	*0.97*	9,881	10,238	*3.49*	21,614	21,977	*1.66*
Passenger revenue	$377,438,473	$379,870,548	*0.64*	$64,278,476	$64,490,371	*0.33*	$441,716,949	$444,360,919	*0.59*
Per revenue passenger, cents	6.7	6.8	*1.47*	(*e*) 11.0	(*e*) 11.0	....	7.1	7.2	*1.39*
Per total passengers, cents	5.3	5.3	....	(*e*) 9.6	(*e*) 9.7	*1.04*	5.6	5.7	*1.75*
Per mile of single track	$27,593	$27,793	*0.72*	$8,236	$8,378	*1.69*	$20,561	$20,798	*1.14*
Per car-mile, cents	44.6	44.8	*0.45*	37.6	38.6	*2.59*	43.4	44.0	*1.36*
Per car operated	(*a*) $16,587	(*a*) $17,046	*2.69*	(*f*) $24,759	(*f*) $24,134	2.60	(*m*) $17,068	(*m*) $17,467	*2.28*
Per car-hour	(*b*) $4.10	(*b*) $4.10	....	(*p*) $4.49	(*q*) $4.55	*1.32*	(*k*) $4.14	(*k*) $4.16	*0.48*
Revenue passengers	5,594,228,682	5,589,527,249	0.08	(*e*) 582,097,091	(*e*) 583,373,097	*0.22*	(*l*) 6,176,325,773	(*l*) 6,172,900,346	0.05
Per mile of single track	408,968	408,955	....	(*e*) 75,140	(*e*) 76,361	*1.59*	(*l*) 288,267	(*l*) 289,706	*0.50*
Per car-mile	6.6	6.6	....	(*e*) 3.4	(*e*) 3.5	*2.86*	(*l*) 5.2	(*l*) 5.2	....
Per car operated	(*a*) 245,163	(*a*) 249,705	*1.82*	(*h*) 178,358	(*h*) 187,173	*4.72*	(*m*) 241,275	(*m*) 246,032	*1.94*
Per car-hour	(*b*) 60	(*b*) 60	....	(*p*) 44	(*p*) 45	*2.23*	(*n*) 58	(*n*) 58	....
Total passengers	7,141,465,488	7,115,513,825	0.36	(*e*) 664,830,692	(*e*) 662,025,859	0.42	(*l*) 7,806,296,180	(*l*) 7,777,539,684	0.37
Per mile of single track	522,078	520,604	0.28	(*e*) 85,820	(*e*) 86,663	*0.98*	(*l*) 364,343	(*l*) 365,014	*0.19*
Per car-mile	8.4	8.4	....	(*e*) 3.9	(*e*) 4.0	*2.50*	(*l*) 6.6	(*l*) 6.6	....
Ratio:									
Transfer passengers to revenue passengers, per cent	26.5	26.0	1.92	13.1	12.3	6.51	25.2	24.8	1.61
Car-miles	845,734,745	847,592,698	*0.22*	171,178,091	166,655,977	2.71	1,016,912,836	1,014,248,675	0.30
Per mile of single track	61,828	76,014	*0.30*	21,933	21,650	1.30	47,335	47,472	*0.29*
Per car operated	(*a*) 37,233	(*a*) 38,085	*2.24*	(*f*) 62,175	(*f*) 61,824	0.6	(*m*) 38,699	(*m*) 39,494	*2.01*
Per car-hour	(*b*) 9.2	(*b*) 9.2	....	(*p*) 11.6	(*q*) 11.6	....	(*k*) 9.5	(*k*) 9.5	....
Car-hours	(*b*) 87,859,148	(*b*) 88,183,278	*0.37*	(*g*) 12,312,871	(*g*) 11,975,022	2.82	(*k*) 100,172,019	(*k*) 100,158,300	0.013
Per car operated	(*c*) 4,128	(*c*) 4,213	*2.03*	(*i*) 4,948	(*i*) 4,956	*0.16*	(*o*) 4,169	(*o*) 4,250	*1.88*

Note—Italics denote decrease.
(*a*) 104 companies. (*b*) 118 companies. (*c*) 101 companies. (*e*) 102 companies. (*f*) 74 companies. (*g*) 82 companies. (*h*) 72 companies. (*i*) 52 companies. (*j*) 181 companies. (*k*) 200 companies. (*l*) 223 companies. (*m*) 178 companies. (*n*) 195 companies. (*o*) 153 companies. (*p*) 77 companies.

000 valuation of road and equipment and $754,000 cash. The total assets are $51,913,854.

Liabilities include $16,707,500, par value, of capital stock; $26,841,782 in funded debt; $2,672,000 in notes issued on account of strike. Other items totaling about $4,000,000 are accounts payable and reserved for depreciation and accidents and damage. The surplus is declared to be $866,625.

Taxation of Gross Receipts Upheld

Constitutionality of the 1919 law for taxation of gross receipts of street railway, traction, gas, electric light, heat and power corporations has been upheld by the Court of Errors and Appeals at Trenton. The decision was rendered in an appeal of the Salem & Pennsgrove Traction Company. The court ruled the additional franchise tax imposed by the 1919 law is in the nature of a license tax and not a levy upon property. The State Board of Taxes and Assessments levied a tax of $4,806 on gross receipts of $139,727 for 1920.

Auction Sales in New York.—At the public auction rooms in New York there were no sales of electric railway securities this week.

Preferred Stock Being Offered. — Pynchon & Company, New York, N. Y., are offering 10,000 shares of the cumulative preferred stock, class "A," of the General Gas & Electric Corporation. The price is $100 per share and accrued dividend, yielding 8 per cent.

Preferred Stock Offered.—John Nickerson & Company and Eastman, Dillon & Company, New York, are offering 12,000 shares of the Metropolitan Edison Company's cumulative participating preferred stock. The price is $98 per share and accrued interest to yield about 7.14 per cent.

Notes of Interurban Offered.—Halsey, Stuart & Company and the National City Company, New York, N. Y., are offering for subscription at 100 and interest $1,000,000 of three-year 6½ per cent secured sinking fund gold notes, Series C, of the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.

Large Increase in Net Income.—For the eight months ending Feb. 28, 1923, the Brooklyn (N.Y.) City Railroad reports a passenger revenue of $7,665,354 against $7,412,175 for the eight months ending Feb. 28, 1922. The net corporate income was $1,318,667 against $950,051 for the eight months ending February, 1922.

Merger Effected.—The merger and consolidation of the Northwestern Pennsylvania Railway, the Northwestern Connecting Railway, the Crawford County Railways and the Peoples Incandescent Light Company into and with the Northwestern Electric Service Company of Pennsylvania has become effective.

Approves Issue.—The Massachusetts Department of Public Utilities has approved the issue by the Holyoke Street Railway of $265,000 6 per cent first mortgage bonds, series C, maturing April 1, 1935. The issue is for the purpose of refunding a like amount of 5 per cent debentures maturing April 1, 1923.

Initial Common Stock Dividend Declared.—The American Water Works & Electric Company, Pittsburgh, Pa., has declared an initial dividend of 1 per cent on the 6 per cent participating preferred stock and the regular quarterly dividend of 1¾ per cent on the 7 per cent cumulative first preferred, both payable May 15 to stock of record May 1.

Gold Bonds Offered.—Halsey, Stuart & Company, New York, The Union Trust Company, Pittsburgh, and W. A. Harriman & Company, New York, are offering $6,000,000 of the first mortgage 5 per cent gold bonds, Series E of the West Penn Power Company. The bonds, due March 1, 1963, are offered at 90 and accrued interest.

Net Income Shows Loss.—The Eastern Massachusetts Street Railway, Boston, Mass., for the two months ended February, 1923, reports revenue and income of $1,868,108 against $1,739,050 for the same period in 1922. The net income was $184,095 for the two months ended February, 1923, and $229,223 for the two months ended February, 1922.

Holders of Chicago Railways Certificates Protest. — Holders of Chicago (Ill.) Railways Series 1 certificates have called a meeting of protest for March 26. They claim that it was agreed at time certificates were distributed that when the company had accumulated a sinking fund of $250,000 certificate holders would receive dividends at the rate of $8 per certificate. There is an unpaid accumulation of $1,384,000.

Increase in Net Income.—For the two months ended Feb. 28, 1923, the Philadelphia (Pa.) Rapid Transit Company reports operating revenue of $7,042,088, against $6,586,706 for the same period in 1922. The net income was $372,219, compared with $350,876 for the two months ended February, 1922. There were 143,428,307 passengers carried in the two months of 1923, with a passenger revenue realized of $6,930,950.

B.R.T. Plan Before Commission.—The plan of reorganizing the Brooklyn Rapid Transit Company (N. Y.), was formally submitted for approval on March 23 to the Transit Commission. George McAneny, chairman of the commission, said that while the commission reserved its final judgment on all the details that required its statutory action, it had been well satisfied with the general scheme developed and with the progress made.

Net Income Increases.—Although for the eight months ending Feb. 28, 1923, the total operating expenses of the Brooklyn (N. Y.) Rapid Transit Company increased more than $1,300,000 the total operating revenues increased sufficiently to produce a net revenue from operation of $50,000 more than the net revenue for the eight months ending Feb. 28, 1922. The net income for the eight months ending Feb. 28, 1923, was $1,732,508 against $1,661,700 for the same period ending Feb. 28, 1922.

Issuance of Equipment Trusts Authorized.—Railway service in Ashland, Wis., will be improved following approval by the Railroad Commission of the application of the Lake Superior District Power Company, parent company of the Ashland Street Railway, Light & Power Company, providing for the issuance of $65,000 equipment trust certificates for the purpose of securing nine cars costing $85,050, $20,050 of which is to be paid in cash.

Gold Bonds Offered.—A syndicate headed by Tucker, Anthony & Company, New York, N. Y., is offering at 99½ and interest to yield more than 6.50 per cent $7,000,000 of first mortgage and refunding lien sinking fund 6½ per cent gold bonds of the Consolidated Power & Light Company. The bonds are dated March 1, 1923, and are due March 1, 1943. The Consolidated Power & Light Company and its subsidiaries will own and operate without competition the gas and electric railway business in Lynchburg besides the electric light and power business in Huntington, W. Va., and Lynchburg and a substantial part of the electric power and light business in Roanoke, Va.

Change Proposed in Financial Structure.—An offering of $6,000,000 convertible 6½ per cent gold debenture bonds of the Standard Gas & Electric Company, Chicago, Ill., due 1933, is being made by H. M. Byllesby & Company, Janney & Company, and Hambleton & Company, at 98, to yield more than 6.75 per cent. The conversion privilege applies to the common stock at prices ranging from $33.33⅓ to $40 per share. The proceeds will be used to retire $2,072,500 face value of 7 per cent notes and to provide additional working capital. A meeting of shareholders has been called for April 3 to authorize a change in the common capital stock from shares of $50 par to shares of no par value and to increase the authorized no par common stock from 300,000 shares to 600,000.

Rochester Doing Better, but Still $160,917 Behind.—The report of Commissioner of Railways Charles R. Barnes of Rochester, N. Y., covering operation of the New York State Railways, shows a surplus of $66,556 for the quarter ended Feb. 28, 1922. The figures were presented to the Council on March 20. The total revenue for the three months was $1,338,672 and the total railway operating expense was $910,203. After all deductions had been made, including the return on investment of $289,479, there remains a surplus of $66,556. Commissioner Barnes' annual report, for the year ended July 31, showed a deficit of $94,001. This added to the deficit for the previous year of operation under service-at-cost made a total deficit of $227,999. The surplus for the quarter Aug. 1 to Nov. 1 was $524, and deducting this sum and the surplus of the last quarter from the total deficit shows a remaining deficit to date, under the service-at-cost contract, of $160,917.

Traffic and Transportation

Accidents Analyzed

Report Submitted Shows That 32 per Cent of Milwaukee Accidents Were Intersection Collisions

That almost one-third of all traffic accidents in the city of Milwaukee during the year 1922 were intersection collisions resulting from two vehicles approaching each other at right angles at street intersections, is one of the conclusions reached in a report recently submitted to the Safety Division of the Milwaukee Association of Commerce.

The report has been prepared at the Safety Division's request from the accident records of the Milwaukee Police Department Traffic Bureau, and of the Milwaukee County Sheriff's and Coroner's records. It is based on an analysis of approximately 4,300 accidents recorded during the last two months of 1921 and the entire year 1922.

The condition of the records was such that most of the desired information was taken directly from these records. In analyzing the records forty-three different causes were assigned which when properly interpreted presented a fair picture of the status of accidents in Milwaukee.

As has already been pointed out, it was found that approximately 1,300 accidents out of a total of 4,200 or about 32 per cent were intersection collisions of two vehicles.

The next largest single group of accidents was one resulting from carelessness of pedestrians. These accidents number about 600 or about 15 per cent of the total. Of these accidents the greater number were due to carelessness, principally "jay walking" either in the middle of the block or diagonally across the street at intersections.

RATIO OF FATALITIES TO ACCIDENTS
CITY OF MILWAUKEE—1922

Cause of Accident	Number of Accidents	Fatalities	Fatalities Per 1,000 Accidents
Motor vehicle crossing tracks.	27	8	296
Speeding.....	39	4	102
Driving while intoxicated....	90	7	73
Children playing in street.....	154	8	52
Carelessness of pedestrian.....	615	16	26
Skidding.....	110	2	18
Intersection accidents.....	1,332	7	5

Of particular interest to electric railway men is Table III of the report which analyzes accidents involving street cars and trains. Here again intersection collisions constitute about a third of the total. Next in importance are accidents resulting from motor vehicles proceeding in the same direction as street cars turning to the left in front of the car. A relatively large number of accidents it is found were due to skidding and about as many were caused by vehicles driving out of parking spaces in front of approaching street cars. The practice of trying to get ahead of street cars is responsible for a number of accidents in which the moving vehicle trying to get ahead of the street car was caught between the street car and an automobile or truck parked along the side of the street.

It was found that there appears to be a relatively large number of accidents between 12 midnight and one in the morning, that there were almost none in the early morning and that they then steadily increased until the peak was reached between 5 and 6 p.m. A decrease followed until midnight. The distribution of accidents by months indicated that the peak was reached in October.

An analysis of accidents resulting in fatalities indicated that the largest specific cause was carelessness of pedestrians and the next largest was children playing in the street. The report points out that vehicle drivers were not always altogether blameless in these cases especially in the cases which occurred outside of the city, that is on suburban roads.

An analysis of accidents by age groups shows that the largest single group was that from six to eleven years of age, the next largest group was five years of age and under, and the next largest eleven to fifteen years of age. The report calls attention to the fact that the number of accidents caused by serious violations of law or traffic ordinances does not constitute a very large proportion of the total, neither was the number of accidents caused by driving while intoxicated a very large proportion of the total.

The highest number of fatalities per thousand accidents resulted from motor vehicles crossing steam road or electric railway tracks. The next highest number was due to speeding. The next number was due to driving while intoxicated, the next in order was due to children playing in the street, the next in order was carelessness of pedestrians, then skidding and finally intersection accidents.

Results of Five-Cent Fare Given —Tariff Continued

The experimental tariff introduced by the Puget Sound Light & Power Company, in the city of Bellingham, providing for twenty street car tokens for $1, a flat 5-cent token rate, has proved a failure as a revenue producer, according to a report submitted by the City Council. The report contained a table of figures showing a loss of $6,468 in revenues for a period of twelve weeks, ending March 11, 1923, in comparison with a similar period ending March 11, 1922. A slight increase in the number of passengers carried during the past twelve weeks was reported, but this gain was not sufficient to make up for the reduction in the former rate of four tokens for 25 cents. Believing that the 90-day period is possibly too short to judge the value of the decrease, the company has agreed to continue the present tariff until midnight of May 31, 1923, and the Council has voted to accept this continuance. The company pointed out that the 5-cent tariff made a 28 per cent reduction in the rate of fare, necessitating an increase of 40 per cent in passenger traffic to keep the revenues to the point where they were prior to the reduction. The increase lacked 33.12 per cent of reaching this figure.

Bill Introduced Provides for Five-Cent Fare

Representatives of the city and the International Railway, Buffalo, N. Y., have reached an agreement on a bill which will be introduced in the Legislature to permit a city-company contract for a 5-cent fare and a 1-cent transfer. Under the proposed legislation the company may be relieved of its franchise, paving and other taxes. Without such tax relief, the International would not consider the restoration of the 5-cent fare, Herbert G. Tulley, president of the International, told Mayor Frank X. Schwab and the municipal authorities.

As its language indicates, the bill is merely permissive. The city and company now cannot enter into an agreement for a 5-cent fare and a 1-cent transfer as the railroad law prohibits a charge for transfers. Neither can the company be relieved of its franchise or paving taxes without special authority from the Legislature.

If the bill is passed the city and company will enter into negotiations for a new fare agreement covering its Buffalo city lines.

Council Turns Down One-Man Car Proposition

In order to keep up service at the 6-cent rate now charged by the Duluth Street Railway it was recently proposed by the Advisory Council of Superior, Wis., that the one-man car be given a trial in that city. This proposal met with a storm of opposition on the part of the labor unions. The City Council turned down the proposition and the matter is now practically as it stood before.

In Duluth the one-man car has never been given a real tryout. Officials of the Duluth Street Railway declare that the finances of the company, in view of its present construction program and its temporary 6-cent fare, will not permit of any experiment along this line. It would mean the purchase of considerable new equipment and would probably meet with some opposition at first on the part of the public, which has never shown any great enthusiasm for the plan.

The one-man car, however, is in operation on two of the company's lines in Duluth, the Park Point and the Kenwood lines. Both lines serve thickly populated districts.

Radial Five-Cent Fare Abolished at Bridgeport

The Connecticut Company is directed, in an order issued on March 28 by the Public Utilities Commission, to return to the flat rate system of fare collection in Bridgeport on April 1. A previous order of the commission permitting a 5-cent fare without transfer privilege is rescinded. This order established a 5-cent fare without transfer on all lines radiating from the center of the city and a 10-cent fare from the center of the city to points beyond the city limits but within the three first fare limits.

The new rate will be a cash fare of 10 cents, or metal tokens, to be sold at the rate of two for 15 cents. Free transfers will be issued.

The action of the commission follows a public hearing which was held in the Bridgeport city hall last week at which testimony was largely in favor of a 7½-cent token fare. The city has been operating under the 5-cent fare order since November 12, 1921.

The order issued at that time authorized the company to charge a flat rate of 5 cents without transfer on all lines radiating from the center of the city, and a 10-cent fare from the center and points beyond the city limits as far as the first fare limit. The order was slightly modified in May, 1922, when the 10-cent rider had the option of buying metal tokens three for a quarter.

In its order the utilities commission said:

> A careful examination and tabulation of the statistics of operating income and expenses show a great improvement over previous revenues in the city of Bridgeport, but present revenues are inadequate to pay a fair return on the fair value of the property used in the public service.

Stock Pledged for New Company

A mass meeting was recently held at Bridgeton, N. J., to ascertain whether the people of that community wanted electric railway service resumed or were satisfied with the buses. The meeting was called at short notice when it was rumored that the trolley tracks would likely be torn up to make room for an improved highway. The entire assets of the old Bridgeton & Millville Traction Company were recently purchased by a resident of Bridgeton. At the mass meeting subscriptions were secured for stock in a new company to operate the railway. Fifty-six residents pledged themselves to take stock in the new company. The Cumberland Traction Company, the new company, has taken over the Bridgeton-Millville division of the company, but buses are being operated in Bridgeton.

The Board of Public Utility Commissioners of New Jersey recently took up the matter of the Cumberland Traction Company, which is seeking a franchise to operate over the route of the old railway. It is claimed that the railway is operating without a franchise. The new company has applied to the state board for permission to issue securities to provide funds to pay for two new cars.

Will Extend One-Man Car Service.—The Charleston (S. C.) Consolidated Railway & Lighting Company has received permission from the City Council of Charleston to extend its one-man car service.

Bus Service Extended.—The Intercity Terminal Railway, North Little Rock, Ark., operating the north side buses announces an extension of bus service on the Little Rock side to Fourth and Louisiana Streets.

New Business Added.—Freight and express business has been added between Abilene, Kan., and Junction City, Kan., by the United Traction System. A freight car also is being run between Junction City and Manhattan over the interurban tracks.

Companies Effect Merger.—The Newburgh Public Service Corporation, a subsidiary of the Orange County Traction Company, has formed an alliance with the Hudson Transit Corporation. Both companies will retain their identity in providing the city of Newburgh with bus operation.

Distinguishes Cars.—The Houston (Tex.) Electric Company has designated all one-man cars by painting a red square on the front. This plan was decided upon in response to a call for suggestions from patrons and to avoid confusion. Front entrance cars were formerly green but repainted yellow. As both old and new type cars are in operation it became necessary to distinguish them.

Detroit Riders Are Customers.—For the purpose of thoroughly educating employees with the understanding that all electric railway passengers are in reality customers, heads of departments of the Detroit (Mich.) Municipal Railway have been asked by Ross Schram, assistant general manager, please to see that whenever new report sheets are printed the word "customer" is substituted for "passenger."

Seeks Polite Employees.—The New Brunswick Power Company, St. John, N. B., has placed in its cars printed cards stating: "The New Brunswick Power Company requests civility and courtesy on the part of its employees and would ask from the public specific instances where this has been deviated from." The company is endeavoring to impress upon its trainmen, especially operators of the one-man cars, the need for being polite even under the most trying circumstances.

Bus Operation Started.—The East St. Louis & Suburban Railway began the operation of two twenty-five passenger White buses in East St. Louis, Ill., on March 15. The bus operation is an experiment which will have influence in shaping the future policy of the company. The fare in the buses is the same as on the electric railway cars, a 7½-cent token or 8 cents cash within the city limits. It was announced in the Jan. 20 issue of the ELECTRIC RAILWAY JOURNAL that the company was planning the installation of the buses.

Book Reviews

Depreciation of Public Utility Properties

By Henry Earle Riggs, A.B., C.E. McGraw-Hill Book Company, New York, 1922; 211 pages.

The publication of a book on this subject is most appropriate at this time because of the important place which depreciation has in valuation of utilities. The author quotes from and analyzes the leading court decisions on depreciation, showing how there has been a gradual development of thought on this subject. He also brings out clearly his own ideas, which include the thought that while a utility is obligated to maintain its property in safe and adequate condition to render continuous service, renewals can and need be made only when due, and "an unmatured obligation to make a renewal is not a loss of value."

Shall State Regulation of Public Utilities Be Abandoned?

An examination of Governor Smith's proposal for municipal control. Issued by the Institute of American Business, New York. Thirty-three pages.

In this pamphlet the subject is considered under four heads, namely, (1) The Attack on State Regulation, (2) Shall We Turn Back the Clock? (3) Governor Smith's Proposals Analyzed, (4) The Good Faith of the State. In the first section a contrast is shown between the Governor's statements in 1919 and 1920 when he indorsed the principle of state regulation and the now famous recommendations in the 1923 message. Statements are then published from different authorities as to the failure of municipal regulation, and arguments are presented for state regulation.

Earning Power of Railroads for 1922

Compiled and edited by Floyd W. Mundy, 442 pages. Published by James H. Oliphant & Company, New York, N. Y.

This book, now in its seventeenth issue, presents important statistics and other facts relating to the earning power and to the securities of railroads, arranged in convenient form for ready reference. The statistics are given for practically all the important railroads in the United States, with a few others.

The introductory chapters explain in a general way the fundamental principles which must be applied by the investor to inform himself as to the value of the stocks or bonds of any railroad.

The tables give vital statistics regarding earnings, mileage, capitalization, tonnage, etc. They are designed to present the statistics mentioned in such a way as to permit of easy comparison between those of each railroad.

The notes give information as to dividends and such other information about the railroads' capitalization, investments, physical and financial condition, etc., as appears to be of direct interest to the investor.

Personal Items

Dr. Hutchinson Joins Engineering Firm

Heads Department of Sanderson & Porter in Charge of Electrification Work

Dr. Cary T. Hutchinson is now associated with Sanderson & Porter, New York, and will direct the department of railroad electrification of that firm. For thirty years he has been engaged in handling railroad electrification problems. In 1891 his then firm, Sprague, Duncan & Hutchinson, built for Henry Villard, who at that early day was considering the electrification of the Chicago freight terminals, the first heavy electric locomotive constructed in this country. It is interesting that nearly a generation later he has just ended service on the commission appointed by the Illinois Central Railroad for planning the electrification of its Chicago terminals.

The Baltimore & Ohio Railroad engaged Duncan & Hutchinson as consulting engineers for the first steam railroad electrification in the United States—built through Baltimore in 1895—and a few years later they made a report to that company on the electrification of the mountain division of its road. This project is now under consideration and there are rumors that it will soon be taken up.

From 1906 to 1908 Dr. Hutchinson was engaged by the Great Northern Railway to take charge of the design and construction of the electric equipment of its road over the Cascade Mountains, the first three-phase electrification to be built in the United States. The considerations that led him to use induction motors for that heavy service were the same that, fifteen years later, influenced the engineers of the Norfolk & Western to use them.

Later the Illinois Central Railroad appointed Dr. Hutchinson a member of its electrification commission. Numerous other investigations and reports on railroad electrification have been made by Dr. Hutchinson. He was selected in 1920 to take charge of the railway electrification division of the Superpower Survey. He has also been connected, as consulting engineer, with many important hydro-electric developments. In addition to these activities, Dr. Hutchinson was, for a time, in charge of the department of electrical engineering at Johns Hopkins University.

As Sanderson & Porter see it, the improved financial condition of the railroads and the urgent need of many of the steam lines for increased facilities, which generally can best be met by electrification, make probable a great increase in the work of this kind. The new department is intended to cover all phases of electrification work.

F. W. Doolittle

New North American Vice-Presidents

Work of Messrs. Fogarty and Doolittle with Huge Holding Company Recognized by Their Advancement

Announcement has just been made of the election of James F. Fogarty and F. W. Doolittle as vice-presidents of the North American Company, New York, effective on April 1.

For the past twenty years Mr. Fogarty has been connected with the North American Company in various capacities. He entered its employ as stenographer in November, 1902. In January, 1910, he became assistant secretary of the company and in March, 1912, was elected secretary and assistant treasurer. He still retains the office of secretary. During the greater part of his long service he has been intimately in contact with the financing of the North American Company and its subsidiaries. He was born in Philadelphia on March 16, 1888. Mr. Fogarty has for several years been a director of the North American Company. He is also vice-president and director of the North American Edison Company and secretary and director of various subsidiary companies of the North American Company, among which are included the Milwaukee Electric Railway & Light Company.

J. F. Fogarty

For several years Mr. Doolittle has been intimately connected with the activities of the North American Company and its subsidiaries as a special rate and valuation engineer with his headquarters at Milwaukee, Wis. Mr. Doolittle was born in Hopkinton, Iowa, in 1883. He was graduated from Princeton University and the University of Colorado. He taught engineering at the University of Colorado and University of Wisconsin and assisted in the development of the statistical department of the Wisconsin Railroad Commission. From there he went to Springfield, Ill., where he did similar organization work for the first Illinois Public Utilities Commission.

In 1914 Mr. Doolittle became director of the Bureau of Fare Research of the American Electric Railway Association and shortly thereafter published his book on electric railway rates and service, known as "Studies in the Cost of Urban Transportation Service." Since 1916 Mr. Doolittle has been retained as consulting engineer by the North American Company and its subsidiaries and has handled investigations of new properties and rates and valuation cases for these companies before various commissions.

Messrs. Horton and Mack Made Vice-Presidents of International Railway

R. Harland Horton, for many years associated with the Philadelphia (Pa.) Rapid Transit Company, has been appointed vice-president in charge of traffic of the International Railway, Buffalo, N. Y. For some time past Mr. Horton has been assistant to the vice-president of the International. Mr. Horton has been a traffic expert with Mitten Management since 1912.

H. L. Mack, who has been with the International Railway, since 1892 in charge of track and maintenance of way, has been elected vice-president in charge of engineering, a new position with the International Railway created by Mitten Management, Inc.

Edgar J. Dickson has resigned as vice-president in charge of traffic of the International Railway, Buffalo, N. Y., according to announcement made by Herbert G. Tulley, president. Mr. Dickson had held the position for almost twelve years, having been appointed when E. G. Connette was president of the company.

Mitten Colors to Fly at Metropolitan Tracks

"Racing," says the New York *Telegram*, "is attracting any number of newcomers to the fold. Two valuable additions are getting together a stable each for campaigning over metropolitan tracks this summer. Joseph B. Choate, Boston banker, has asked for registration of colors and will hope to

see one or more of his newly acquired thoroughbreds land in the charmed circle. Thomas E. Mitten, Philadelphia traction magnate, is also in the field."

Mr. Sparks Goes to Chicago

Ralph M. Sparks became vice-president of the Yellow Coach Manufacturing Company, Chicago, Ill., on April 1 in charge of the public utility division of that company. Mr. Sparks, a native of Muncie, Ind., received his education in the local high school and at Purdue University. In 1910 he became special assistant to President P. F. Sullivan of the Bay State Street Railway. During his nine years with the railway, he filled many positions, being successively general passenger agent, assistant to the general manager, assistant to the first vice-president and transportation manager in charge of operations. In 1919 Mr. Sparks organized a company for the distribution of Willys-Knight cars in Worcester, Mass., and Worcester County. Mr. Sparks, two years later was the prime mover in the organization of the public utility division of the Republic Motor Truck Company at Alma, Mich. In this position, he developed and introduced the Republic Knight motored bus. Fifty-two of these buses were installed in eight cities, namely, Baltimore, Boston, Providence, New Haven, Newark, Youngstown, San Diego and Detroit.

Employee New Director on P. R. T. Board

Ralph R. Nyman, a motorman in the employ of the Philadelphia (Pa.) Rapid Transit Company, on March 21 was elected a member of the board of directors of the company. Mr. Nyman is president of both the Co-operative Welfare Association, the organization of the P. R. T. employees which represents the men in their dealings with the company, and also the Wage Dividend Fund, which represents the men in the profit-sharing plan operated by the company. Mr. Nyman was one of the three new directors elected by the stockholders at the annual meeting. He succeeded John McElroy, the first employee elected to the directorate, who is compelled to step out of the board through promotion to foreman, which ranks him as an official and no longer as an employee. Mr. Nyman was born in Boonesboro, Md., down in the Blue Ridge Mountains. He started out in street railroading in Baltimore, where he worked for five years as a motorman. He then went to Philadelphia. He has been a committeeman from the Belmont carhouse for seven years, being known as "No. 1 committeeman," the one receiving the highest number of votes of the men in the carhouse. Mr. Nyman is a bachelor.

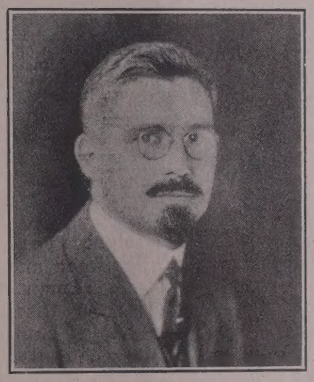
Frank Titus has succeeded M. T. O'Connell as engineer of power stations of the Capital Car Line, Bismarck, N. D., a 1.5-mile line owned and operated by the State.

L. H. Palmer Becomes General Manager

Well Known Baltimore Official Promoted to Post Formerly Held by H. B. Flowers

L. H. Palmer was appointed on March 27 by the board of directors of the United Railways & Electric Company, Baltimore, to the position of general manager of that company, made vacant by the recent resignation of Herbert B. Flowers, who has become president of the New Orleans Public Service, Inc. Mr. Palmer's previous title was assistant to the president, a position which he has held since October, 1917.

Louis Hooker Palmer, through his activity in connection with the solving of various national electric railway problems and in association work, is one of the best known men in the executive and transportation side of the industry. He has a reputation for getting things done, and not only in company, but in association work, puts his whole energy into anything which he undertakes. By his tact and his spirit of helpfulness he inspires a willing co-operation in those with whom he is associated.



L. H. Palmer

Mr. Palmer was born in Chicago. His business life, however, has been spent in the East. After he was graduated from Williams College in 1902, Mr. Palmer was associated with the operating department of the Central Railroad of New Jersey for four years. He then entered the service of the Metropolitan Street Railway, New York, as a clerk in the office of Oren Root, vice-president and general manager. In April, 1908, he was appointed assistant to the general manager for the receivers of that company and a year later was made superintendent of transportation. He resigned in 1912 to join the organization of Harrison Williams. In June, 1915, he went to Baltimore to do some special work for the president of the United Railways & Electric Company, and in the following year became connected with the Eastern Pennsylvania Railways, first as general superintendent and then as general manager. He returned to the Baltimore Company in 1917, at the request of William A. House, then president of the company.

Mr. Palmer was president last year of the American Electric Railway Transportation & Traffic Association and is chairman this year of the American committee on mail pay and the special committee on co-operation with the National Safety Council, as well as a member of other association committees. He is also a director of the Maryland Public Utilities Association, formed recently; a trustee of the United Railways Building Association, vice-president of the Traffic Club of Baltimore, and vice-president and one of the organizers of the Baltimore Safety Council.

William H. Penoyer has replaced A. J. Crane as roadmaster of the Schenectady (N. Y.) Railway.

H. M. Brown has succeeded John Jacobs as vice-president of the Kaydeross Railroad Corporation, Ballston, New York.

J. M. Donington has succeeded George R. Doremus as assistant secretary of the J. G. White Company, Inc., New York, N. Y.

E. T. Jones has replaced S. W. Dill as district claim agent of the electric division of the New York Central Railroad.

A. C. Ray, formerly an assistant treasurer of the American Power & Light Company, New York, N. Y., is now treasurer.

John Nichol, vice-president of the Pine Bluff (Ark.) Company, has been chosen president of the Simmons National Bank of Pine Bluff to fill the vacancy caused by the death of Dr. Z. Orto.

William L. Sayers is continuing as general manager of the Marine Railway, operated between Manhattan Beach and Brighton Beach, N. Y. He will not longer perform the duties of secretary, this office now being taken care of by Robert J. Seekamp.

W. F. Graves, chief engineer of the Montreal (Que.) Railways, has resigned. The assistant chief engineer, R. M. Hannaford, is acting in the capacity of chief engineer.

Charles W. Wilson has succeeded W. F. Tshudy as superintendent of the Penna.-New Jersey Railway, and the New Jersey & Pennsylvania Traction Company, Trenton, N. J.

W. P. Ballard, formerly superintendent of the Visalia Electric Railway, Exeter, Calif., has been appointed Industrial agent for the Southern Pacific System in the San Joaquin Valley.

A. L. McFarland, formerly inspector of the Charlotte (N. C.) Electric Railway, has been promoted to the position of chief inspector. In this capacity he succeeds the late Robert J. Small.

Fred A. Lorentz has been appointed to the position of chief engineer of the Board of Public Utilities of the city of Los Angeles to succeed H. Z. Osborne, Jr., resigned. Mr. Lorentz has been assistant chief engineer of the board for several years. He entered the service of the board twelve years ago.

S. P. MacFadden, secretary to the district manager of Stone & Webster, has been transferred to Port Arthur, Tex., as superintendent of the Port Arthur Light & Power Company and the Port Arthur Ice & Refrigerator Company. Mr. MacFadden relieves Joseph Bowes, who has been transferred to Beaumont, Tex., as general superintendent of the Eastern Texas Electric Company.

E. J. Seaborn, formerly assistant treasurer of the Truckee River Power Company, has been transferred to Houston as assistant treasurer of the Houston Electric Company and the Galveston-Houston Electric Railway. Mr. Seaborn has been with Stone & Webster for sixteen years and was with the Truckee River Power Company for five years. He is taking the place vacated by the transfer of H. L. Harding to Boston in the treasurer's department of Stone & Webster.

Albert E. Reynolds, who resigned in January as general manager of the United Traction Company, Albany, N. Y., to become connected with the engineering firm of Sanderson & Porter, has been made vice-president and general manager of both the Springfield (Mo.) Traction Company and the Springfield Gas & Electric Company, managed by the engineering firm. He succeeds in these positions E. C. Deal, who has become connected with the Electric Bond & Share Company, New York.

Gus W. Wagner, formerly general purchasing agent of the Detroit (Mich.) United Railway, has been placed in charge of the steam and electric railway sales division of the I. M. Jacobson & Sons Company. His offices will be located at 1011 Majestic Building, Detroit, Mich. Mr. Wagner was long connected with the Detroit railway. As a matter of fact he entered its employ as a boy in 1901 under A. H. Stanley, the present head of the London underground group. He caught on quickly and was advanced rapidly through the organization until finally he succeeded A. F. Edwards in the purchasing department when Mr. Edwards was made treasurer. Mr. Wagner's railway career was reviewed briefly in the ELECTRIC RAILWAY JOURNAL for June 10, 1922. Among the products of the Jacobson company are babbitt and bearing metals and white metal alloys.

Claude O. Weidman, general manager of the Morris County Traction Company, Morristown, N. J., has resigned. Otto G. Schultz, treasurer of the company, will in addition assume Mr. Weidman's duties. Mr. Weidman became superintendent of the company eight years ago and three years later was advanced to the position of general manager. Previous to going to Morristown he was superintendent of transportation of the Otsego & Herkimer Railroad. Mr. Charles Fields has been appointed superintendent of the company. The Morris County Traction Company operates an interurban system of more than 58 miles through a well-built-up section of New Jersey.

Mr. Hecht Chairman of the Board

R. S. Hecht, who has been succeeded as president of the New Orleans (La.) Public Service, Inc., by H. B. Flowers, will retain the chairmanship of the board of directors and continue his supervision of the financial affairs of the company. Mr. Hecht is a commanding figure in the financial and banking activities of New Orleans. It was he, very largely, who succeeded in bringing together the representatives of the holders of the various issues of securities of the New Orleans Railway & Light Company and in reconciling the conflicting interests to a workable reorganization plan. He is president of the Hibernia Bank & Trust Company, New Orleans. A portrait and a biography of Mr. Hecht were published in the ELECTRIC RAILWAY JOURNAL for Nov. 11, 1922. A. L. Kempster has been re-elected vice-president and general manager of the company.

The New Orleans *Item* said of Mr. Hecht:

> R. S. Hecht leaves the stockholders and bondholders greatly in his debt. In a sense, he achieved the impossible. A number of the policies he introduced and some of the things he did for this company were opposed by this newspaper. However, one can differ with Mr. Hecht, and oppose him, without losing personal regard for him, and even come away with increased respect for his abilities.

Obituary

J. S. Walsh

Julius S. Walsh, eighty years old, financier and retired railroad and electric railway magnate, chairman of the board of directors of the Mississippi Valley Trust Company, St. Louis, and for many years a dominant figure in the financial world of the Central West, died in St. Louis on March 21.

Mr. Walsh was born in St. Louis on Dec. 1, 1842. He was educated in the town schools, later attending St. Joseph College, Bardstown, Ky., where he received his A.B. in 1861; Columbia University, where he obtained his LL.B. in 1864, and his A.M. at St. Louis University the following year. He also received an honorary LL.D. from the latter institution in 1904.

When his father died in 1864, Mr. Walsh became administrator of his estate and succeeded him as a director of the Bank of the State of Missouri and of the Franklin Avenue, Union, Fairgrounds and the Suburban Street Railways.

About 1870, when B. Gratz Brown was ambitious to become Governor of Missouri, he removed his residence from St. Louis to Iron County and upon his election as Governor finally persuaded Mr. Walsh to succeed him as president of the Citizens' Street Railway. Mr. Walsh had built the Northern Central line in 1885, and that and other horse car lines he controlled were the forerunners of the present unified system, the United Railways. Later he became president of the St. Louis & Suburban Railway. In 1875 Mr. Walsh succeeded Mr. Dickson as president of the St. Louis Bridge Company, which built the famous Eads bridge, and remained as its head.

Later Mr. Walsh became interested in electrical development and in 1889 was elected president of the Municipal Electric Light Company. This company was later absorbed by the present Union Electric Light & Power Company, St. Louis.

He organized the Mississippi Valley Trust Company in 1890 and became its president, and in 1906 was made chairman of the board, holding that position at his death.

William Loft, for thirty-two years superintendent of lines of the Springfield (Mass) Street Railway, died in Springfield on March 22, aged seventy. He installed the first telephone system for the New England Telephone & Telegraph Company in Cambridge, which was started with thirty-two subscribers. Later he assisted in building the first trolley systems in Boston and Cambridge for the Thomson-Houston Electric Company. Later, Mr. Loft had charge of overhead construction for the car lines in Utica, N. Y., and other places, following which he went to Springfield to direct similar work there. He was then made superintendent of lines.

Philip Increase Robinson, manager of the Baton Rouge (La.) Electric Company, died on March 22. He had been a prominent figure in the railway and lighting field since 1908, when he entered the statistical department of Stone & Webster, Inc. In less than three months after joining the Stone & Webster forces he was transferred to Houghton, Mich., as assistant to the engineer. He was made assistant superintendent of the Houghton County Traction Company in 1912. Later he entered the lighting field in Houghton, Fort Madison and Dallas. It was only in February of this year that he became manager of the Baton Rouge Electric Company. Mr. Robinson was born in 1886 and made his home in Waterville, Me. He was graduated from the University of Maine in 1906 as an electrical engineer. He is survived by his wife and two children.

Major Abram J. Gifford, formerly in charge of the transportation department of the General Electric Company for many years, died on March 20 at his home in Schenectady after an operation. Major Gifford was born at Hudson, N. Y., in 1849. Prior to his entry into the electrical industry, he was in charge of the Indian agency at Fort Berthold, N. D., from 1884 to 1889, under appointment by President Chester A. Arthur. In 1891 he became connected with the Northwest Thomson-Houston Company at St. Paul, but was transferred in 1894 to the transportation department of the General Electric Company at Chicago. In 1899 he was put in charge of the transportation interests of the company and moved to Schenectady, where he resided until the time of his death. On March 1, 1920, he gave up his active duties, which were taken over by M. C. Fitzgerald, but continued on in an advisory capacity.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Economic Adjustment Desirable

Report and Recommendations Presented of President's Conference on Unemployment—Mr. Hoover Pleased

The special committee on unemployment from the depression in the business cycle appointed by Secretary Hoover, as chairman of the President's Conference on Unemployment, has made public the conclusions reached after more than a year's study. The committee comprised:

Owen D. Young, president General Electric Company, as chairman; Joseph H. Defrees, formerly president U. S. Chamber of Commerce; Mary Van Kleek, Russell Sage Foundation; Matthew Woll, vice-president American Federation of Labor; Clarence M. Woolley, chairman American Radiator Company, Edward E. Hunt, secretary.

The committee was requested by Secretary Hoover to make an exhaustive investigation into the facts and causes of periodic business depression—hard times—and see if suggestions could be made for remedial steps that might be taken by the business community to avoid such interruptions to prosperity and employment.

COMMITTEE ISSUES SUMMARY OF CONCLUSIONS

The committee has now issued its own summary of conclusions and suggestions. This will be followed at an early date with the complete publication of the facts and much of the material collected.

The committee analyzes the various economic phenomena of the periodic business boom and sequent depression, and its conclusions are that preventative measures must lie in the better handling of business in boom times because depressions are due to over expansion, inflation, loss of efficiency, waste, and extravagance in the boom periods; that therefore the first point of attack on the problem must be more informed action by individual business men in periods of rising markets in order that excessive expansion may be prevented and the extent of the decline reduced. Stress is laid upon the necessity of better understanding of the business cycle by the business executives generally. The suggestions for control of excessive expansion embraces recommendations as to the control of credit by individual banks, possible control of inflation by the Federal Reserve System, the control by individual business men of expansion in their own business, and the retardation in boom times of governmental and large utility building and construction.

The methods of reducing the extent of the decline lie in the building up of governmental and public utility construction in times of depression, the use of unemployment funds, and the expansion of Federal, State, and farm employment bureaus. The better control of credit against over-expansion and speculation through individual banks and the guidance of business itself by danger signals of over-expansion are fundamental.

The committee considers that before the banks, business men, and others can take constructive action in the enlightened conduct of business in this relation, there must be recruited and constantly disseminated the fundamental information on which the trends in business can be properly adjudged by each individual business man, and it strongly recommends the recruiting of enlarged and more systematic statistical information by the Department of Commerce and its wider dissemination.

The committee calls attention to the fact that the ebb and flow in demand for consumable goods is less controllable than that of construction of buildings and equipment both governmental and private; that the tendencies of boom periods is to thrust a double burden on the community of providing for increased consumable goods and at the same time undertaking the larger burdens of construction; that therefore, the construction industries are to some extent the balance wheel on the ebb and flow of boom and depression.

The committee points out the part the Federal Reserve Banks can play in restriction of speculation and at the same time in liberalizing credit in times of depression.

A questionnaire is proposed to business men, bankers, managers of public utilities, wage earners, and public organizations with a view to stimulating organized consideration and inquiry.

The report does not suggest panaceas or economic revolution, but seeks to drive home the facts that the enlargement of judgment in individual business men as to the trend of business and consequent widened vision as to approaching dangers will greatly contribute to stability, and that the necessary information upon which such judgments can be based must be systematically recruited and distributed.

British Get Indian Contract

The English Electric Company has obtained a contract for the electric equipment of the cars to be used on the Bombay suburban lines of the Great Indian Peninsula Railway. The overhead equipment will be carried out by the British Insulated & Helsby Cables, Ltd.

Westinghouse Air Brake Sees Satisfactory Prospects

The Westinghouse Air Brake Company, Wilmerding, Pa., has submitted its report on operations during 1922. After providing from earnings for federal taxes, dividends and adequate reserves, there was a net addition to surplus of $2,252,881. In consideration of the industrial and financial condition existing early in the year under review it was deemed advisable by the board to reduce the first quarterly dividend from $1.75 to $1 a share and this rate prevailed until the last quarter when the original rate, which it was felt the earnings then justified, was restored.

At a special meeting of stockholders which was held on March 2 the authorized capital stock of the company was increased from $30,000,000 to $50,000,000. The directors on the following day declared a stock dividend of 35 per cent payable April 30 to stockholders of record on March 29. In the statement to the stockholders it was stated that when the last annual report was issued the outlook for the immediate future was not encouraging due to the unsettled business conditions then prevailing, but the prospects for the current year were satisfactory. The annual meeting of the company will be held in Wilmerding on April 10.

National Association of Manufacturers

The annual conference of the National Association of Manufacturers will be held at the Waldorf-Astoria in New York on May 14, 15 and 16.

Hardwood Institute Annual Meeting

The Hardwood Manufacturers' Institute will hold its first annual convention on May 10 and 11 at the Blackstone Hotel, Chicago. The Institute was organized in June, 1922, with some seventy members. Its membership now includes more than 300 hardwood producers, and its lumber inspection force of three men has now increased to an inspection corps of twelve.

Metal, Coal and Material Prices

Metals—New York	March 27, 1923
Copper, electrolytic, cents per lb	17.187
Copper wire base, cents per lb	19.375
Lead, cents per lb	8.25
Zinc, cents per lb	7.975
Tin, Straits, cents per lb	47.50
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	6.50
Somerset mine run, Boston, net tons	3.125
Pittsburgh mine run, Pittsburgh, net tons	2.375
Franklin, Ill., screenings, Chicago, net tons	2.375
Central, Ill., screenings, Chicago, net tons	1.625
Kansas screenings, Kansas City, net tons	2.60
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	7.50
Weatherproof wire base, N. Y., cents per lb.	19.50
Cement, Chicago net prices, without bags	$2.20
Linseed oil (5-bbl. lots), N. Y., per gal	$1.07
White lead, (100-lb. keg), N.Y., cents per lb	13.375
Turpentine, (bbl. lots), N.Y., per gal	$1.57

Rolling Stock

Indianapolis (Ind.) Street Railway expects to spend $500,000 for new cars.

Citizens Traction Company, Oil City, Pa., has placed the order as of March 15 for six Birney cars.

Tampa (Fla.) Electric Company has ordered eight single-truck safety cars. Delivery is expected in May.

Youngstown (Ohio) Municipal Railway recently placed an order for eleven buses. By April 1 the fleet will total eighteen buses.

Ashland (Wis.) Street Railway, through the Wisconsin Railroad Commission, has been authorized to provide for the issuance of $65,000 equipment trust certificates for the purpose of securing nine cars costing $85,050.

Montreal (Que.) Tramways is about to call for tenders for the construction of fifty cars. The order will mean an expenditure of approximately $750,000. No particular type of car will be specified in calling for tenders.

Missouri-Kansas-Texas Railway has purchased from the General Motor Truck Company at its branch in Dallas a GMC Model K-20 motor bus. The bus has been placed in service between the city of Waco and Bellmead.

New York, New Haven & Hartford Railroad, New York, N. Y., has increased by five its original contract for electric locomotives recently placed with the Westinghouse Electric & Manufacturing Company. Twelve locomotives are now covered by the contract.

Boston (Mass.) Elevated Railway recently placed orders for fifty cars from the Brill Company, twenty-five from the Laconia Car Company and twenty-five from Osgood-Bradley. These 100 cars are for use on surface lines and are of the same type as the last 200 purchased. They are double-truck cars arranged for one-man operation if desired.

Pittsburgh (Pa.) Railways has placed an order for twenty additional double-truck cars. The cars are to be built by the St. Louis Car Company and equipped with Westinghouse motors and airbrakes. They were added to a recent order for fifty-five cars, making a total of seventy-five new cars to be delivered within four months beginning in June. The cars cost approximately $11,000 each.

St. Petersburg, Fla.—The city is now advertising for bids to be opened on April 2 for the following cars: Three standard, single-truck Birney type safety cars, and one standard double-truck, double-end, safety car, with one double folding door at each end of the right-hand side, arranged for one-man operation and with a seating capacity of fifty-two passengers. Specifications have been sent out to car builders.

Eastern Massachusetts Street Railway, Boston, Mass., as noted in the issue of the ELECTRIC RAILWAY JOURNAL for March 24, has placed an order with the J. G. Brill Company for fifty one-man two-man cars. These cars will be very similar to the twenty-five cars ordered about nine months ago and described in this paper. The order for motors was divided. The General Electric Company will supply motors for twenty of these and the Westinghouse Electric & Manufacturing Company will furnish thirty equipments.

Track and Roadway

Lehigh Valley Transit Company, Allentown, Pa., during 1922 rebuilt 3 miles of track and laid twenty-two blocks of paving.

Three Rivers (Que.) Traction Company, through its manager, states that the company contemplates a $75,000 extension.

Tampa (Fla.) Electric Company will spend about $300,000 in improvements during the present year. Double-tracking of various lines is planned.

Lehigh Traction Company, Hazelton, Pa., and the **Wilkes-Barre & Hazelton Railway** have received 7,000 and 3,000 ties respectively. These will be laid in conjunction with new rails to go down this summer.

Pacific Electric Railway, Los Angeles, Calif., is enlarging its freight storage yards in Los Angeles approximately 100 per cent and some eight freight storage sidings have been completed recently on the company's lines between Los Angeles and the harbor for more adequately handling of this growing freight business.

Salt Lake & Utah Railroad, Salt Lake City, Utah, in co-operation with the federal government will construct a siding and erect a terminal station in connection with the construction of a permanent camp for the accommodation of 5,000 summer training troops. The camp will be established at Jordan Narrows about 12 miles south of Salt Lake City.

Power Houses, Shops and Buildings

West Penn Company, Pittsburgh, Pa., through one of its subsidiary companies, recently purchased the Iron Exchange Building. The growth of the properties has made this step imperative.

Union Traction Company of Indiana, Anderson, Ind., has been manufacturing since Feb. 1 all of its own power at its Anderson plant. The company has shut down the Eaton and Winchester plants.

Louisville (Ky.) Railway, has placed contracts for repairs to its Main Street carhouse, which recently burned, and has secured a building permit for a new office and gymnasium at the Fourth Street carhouse, to cost $30,000. Contracts for rebuilding the Fourth Street property will be placed within a few days.

Trade Notes

Ohmer Fare Register Company, Dayton, Ohio, has issued a series of business lessons illustrating the weakness of any method of collecting fares that is not in harmony with correct business principles.

Cama, Norton & Company, Bombay, India, importers of electrical machinery plants, devices and appliances, are soliciting the catalogs and correspondence of general engineering firms and trade pertaining to allied industries.

Texas Company, New York, N. Y., producer of Texaco petroleum products, has been awarded the contract for the lubricating requirements for the rolling stock equipment of the United Railways & Electric Company, Baltimore, Md., for a period covering eighteen months.

Westinghouse High Voltage Insulator Company, Derry, Pa., a subsidiary of the Westinghouse Electric & Manufacturing Company, has started work at Emeryville, Calif., on the first high-voltage porcelain insulator works to be built west of the Mississippi River.

Rubber Insulated Metals Corporation, New York, N. Y., announces that about April 1 it will remove its general offices from 50 Church Street, New York City, to 18 Oliver Street, Newark, N. J. This concern manufactures the well known "Rimco" rubber-insulated pliers, screw drivers, and other tools—popularly known as "the safety tools" for linemen and high-tension work. The new location will give the Rubber Insulated Metals Corporation larger accommodations and afford the company every facility for handling a steadily increasing business.

Metal & Thermit Corporation, New York, N. Y., has appointed Charles F. Lederer as general supervisor of rail welding to assume entire charge of all technical work in the field. This appointment is made in order to organize more effectively for the greatly increasing thermit rail welding business. Mr. Lederer is well fitted for this new position. He has been connected with the rail welding department of the corporation for more than two and a half years and was formerly superintendent of way of the Milwaukee Electric Railway & Light Company.

New Advertising Literature

Walter A. Zelnicker Supply Company, St. Louis, Mo., has issued Bulletin 300, giving useful information in regard to track material and describing its products.

Kinnear Manufacturing Company, Columbus, Ohio, has issued an illustrated booklet entitled "Exposure Hazard and Window Protection," showing how the Kinnear steel rolling shutters safeguard buildings from fire. Shutters approved by the Underwriters Laboratories, Inc., are illustrated and described.